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Crustacea Decapoda : Palaemonoid shrimps from the Indo-West Pacific region mainly from New Caledonia

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ABSTRACT

A collection of 52 species of palaemonoid shrimps from the Muséum national d'Histoire naturelle, Paris, is reported upon. Material is derived principally from the New Caledonian region but also includes specimens from Aden/Yemen, Comoro Islands, western Indian Ocean, Philippines, Indonesia and Wallis Island. Specimens have been collected from intertidal depths to over 600 m. Ten species have been collected from water depths of over 100 m.

Two new genera of pontoniine shrimp are designated : *Climeniperaeus*, for *Periclimenaeus truncoideus* Chace & Bruce, 1993, and *Typtonychus*, for a new species, *T. crassimanus*. The following species are transferred from the genus *Typton* to the new genus *Typtonychus* : *T. anomalus* (Bruce, 1979), *T. dentatus* (Fujino & Miyake, 1969), and *T. dimorphus* (Bruce, 1986). These species are probably all associates of Porifera.

Six new species of pontoniine shrimp are described. These include *Conchodytes philippinensis*, from an unknown locality in the Philippines; *Mesopontonia verrucimanus*, from 184-186 m in the Tanimbar Islands, Indonesia; *Periclimenaeus colodactylus*, from 20-25 m in New Caledonia, in association with *Diplosoma versicolor* Monniot; *Periclimenes involens*, from 92-97 m, off Mindoro, Philippines, of unknown association; *Pontonia compacta*, from 10-60 m, in New Caledonia, in association with *Pyura albaneyensis* Michaelson and *Pontonia simplicipes*, from 71 m, in the Chesterfield Islands, in association with *Pyura nigricans* Heller.

RÉSUMÉ

Crustacea Decapoda : Crevettes palaemonides de l'Indo-Ouest Pacifique, principalement de la Nouvelle-Calédonie.

Ce travail traite d'une collection de 52 espèces de crevettes palaemonides se trouvant au Muséum national d'Histoire naturelle, à Paris. La plupart du matériel examiné provient de la Nouvelle-Calédonie mais également d'Aden (Yémen),

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des îles Comores, de l'océan Indien occidental, de l'Indonésie, des Philippines et de l'île Wallis. Les récoltes proviennent de profondeurs comprises entre la zone intertidale et 600 m. Dix espèces ont été récoltées à plus de 100 m de profondeur.

Deux nouveaux genres de Pontoniinae sont décrits : *Climeniperaeus* pour *Periclimenaeus truncoides* Chace & Bruce, 1993, et *Typtonychus*, pour une nouvelle espèce, *T. crassimanus*. Les espèces suivantes sont tranférées du genre *Typton* au nouveau genre *Typtonychus* : *T. anomalus* (Bruce, 1979), *T. dentatus* (Fujino & Miyake, 1969), et *T. dimorphus* (Bruce, 1986). Ces espèces sont vraisemblablement toutes associées à des Porifera.

Six autres espèces nouvelles de Pontoniinae sont décrites : *Conchodytes philippinensis*, d'une localité inconnue des Philippines; *Mesopontonia verrucimanus*, récoltée par 184-186 m de profondeur aux îles Tanimbar, en Indonésie; *Periclimenaeus colodactylus*, trouvé par 20-25 m, en Nouvelle-Calédonie, en association avec l'ascidie *Diplosoma versicolor* Monniot; *Periclimenes involens*, récolté par 92-97 m, au large de Mindoro, aux Philippines et dont l'hôte est inconnu; *Pontonia compacta*, capturée entre 10 et 60 m, en Nouvelle-Calédonie et qui vit en association avec l'ascidie *Pyura albaneyensis* Michaelson, et enfin, *Pontonia simplicipes*, trouvée aux îles Chesterfield par 71 m de profondeur, en association avec l'ascidie *Pyura nigricans* Heller.

INTRODUCTION

Information is provided on 52 species of marine palaemonoid shrimps from the collections of the Muséum national d'Histoire naturelle, Paris, derived principally from operations of the Institut français de Recherche scientifique pour le Développement en Coopération (ORSTOM) and the Muséum, in New Caledonian seas, with further material derived from collections in Indonesian and Philippine waters. Other material, collected by ORSTOM zoologists, from elsewhere, and deposited in the national collections, is also discussed.

Two new genera of the subfamily Pontoniinae are designated and seven new species are described, four from New Caledonia, two from the Philippines and one from Indonesia. The collection studied includes material from both shallow and deep water, collected between 1959 and 1993, the deepest specimen coming from a depth of 620-666 m.

The specimens are mainly deposited in the collections of the Muséum national d'Histoire naturelle, Paris, and are designated by MNHN-Na catalogue numbers. Specimens donated to the Northern Territory Museum, Darwin, are indicated by NTM Cr catalogue numbers. Carapace length (CL) refers to the postorbital carapace length.

Restricted synonymies only are provided. Fuller synonymies are generally to be found in HOLTHUIS (1952) and CHACE & BRUCE (1993).

SPECIES LIST

PALAEMONIDAE

PALAEMONINAE

1. *Brachycarpus biunguiculatus* (Lucas, 1846)
2. *Leander plumosus* Bruce, 1994
3. *Leander tenuicornis* (Say, 1818)
4. *Palaemon debilis* Dana, 1852
5. *Urocaridella antonbruunii* (Bruce, 1967)
6. *Urocaridella urocaridella* (Holthuis, 1950)

PONTONIINAE

7. *Altopontonia disparostris* Bruce, 1990
8. *Anchiopontonia hurii* (Holthuis, 1981)
9. *Anchistus custos* (Forsskål, 1775)
10. *Anchistus pectinis* Kemp, 1925
11. *Climeniperaeus truncoideus* (Chace & Bruce, 1993) comb. nov.
12. ***Conchodytes philippinensis*** sp. nov.
13. *Dasycaris zanzibarica* Bruce, 1973
14. *Exopontonia malleatrix* Bruce, 1988
15. *Mesopontonia brucei* Burukovsky, 1991
16. ***Mesopontonia verrucimanus*** sp. nov.
17. *Mesopontonia* sp.
18. *Onycocaris aualitica* (Nobili, 1904)
19. *Palaemonella rotumana* (Borradaile, 1898)
20. *Parapontonia nudirostris* Bruce, 1968
21. *Periclimenaeus arabicus* (Calman, 1939)
22. ***Periclimenaeus colodactylus*** sp. nov.
23. *Periclimenaeus storchi* Bruce, 1989
24. *Periclimenaeus stylirostris* Bruce, 1969
25. *Periclimenella spinifera* (de Man, 1902)
26. *Periclimenes albatrossae* Chace & Bruce, 1993
27. *Periclimenes alcocki* Kemp, 1922
28. *Periclimenes* aff. *alcocki* Kemp, 1922
29. *Periclimenes amboinensis* (de Man, 1888)
30. *Periclimenes commensalis* Borradaile, 1915

31. *Periclimenes galene* Holthuis, 1952
32. *Periclimenes hirsutus* Bruce, 1971
33. *Periclimenes imperator* Bruce, 1969
34. *Periclimenes incertus* Borradaile, 1915
35. ***Periclimenes involens*** sp. nov.
36. *Periclimenes magnificus* Bruce, 1979
37. *Periclimenes nilandensis* Borradaile, 1915
38. *Periclimenes novaecaledoniae* Bruce, 1969
39. *Periclimenes obscurus* Kemp, 1922
40. *Periclimenes psamathe* (de Man, 1902)
41. *Periclimenes rectirostris* Bruce, 1981
42. *Periclimenes tenuipes* Borradaile, 1898
43. *Periclimenes uniunguiculatus* Bruce, 1990
44. *Periclimenes indicus* (Kemp, 1915)
45. *Pontonia anachoreta* Kemp, 1922
46. *Pontonia ascidicola* Borradaile, 1898
47. ***Pontonia compacta*** sp. nov.
48. ***Pontonia simplicipes*** sp. nov.
49. *Thaumastocaris streptopus* Kemp, 1922
50. ***Typtonychus crassimanus*** gen. nov., sp. nov.

ANCHISTIOIDIDAE

51. *Anchistioides willeyi* (Borradaile, 1899)

HYMENOCERIDAE

52. *Hymenocera picta* Dana, 1852

GEOGRAPHICAL DISTRIBUTION OF REPORTED SPECIES

New geographical records with an asterisk. New taxa in bold.

New Caledonia

*Altopontonia disparostris, Anchistioides willeyi, *Anchistus custos, Anchistus pectinis, *Brachycarpus biunguiculatus, Dasycaris zanzibarica, Hymenocera picta, *Leander plumosus, Palaemon debilis, Parapontonia nudirostris, *Periclimenella spinifera, Periclimenaeus arabicus,* ***Periclimenaeus colodactylus****, Periclimenes amboinensis, *Periclimenes hirsutus, Periclimenes imperator, Periclimenes incertus, *Periclimenes magnificus, *Periclimenes nilandensis, Periclimenes novaecaledoniae, *Periclimenes obscurus, Periclimenes psamathe, *Pontonia ascidicola,* ***Pontonia compacta****, Thaumastocaris streptopus,* ***Typtonychus crassimanus****, Urocaridella antonbruunii.*

Chesterfield Islands

Brachycarpus biunguiculatus, *Periclimenaeus stylirostris,* ***Pontonia simplicipes**.*

Loyalty Islands

**Anchiopontonia hurii, *Brachycarpus biunguiculatus, *Leander tenuicornis, *Palaemonella rotumana, *Periclimenes commensalis, *Urocaridella antonbruunii.*

Wallis and Futuna Islands

Periclimenes tenuipes.

Philippines

Conchodytes philippinensis*, Palaemonella rotumana,* ***Periclimenes involens****, *Periclimenes rectirostris, *Climeniperaeus truncoideus, Urocaridella urocaridella.*

Indonesia

Leander tenuicornis, ***Mesopontonia verrucimanus****,* ***Mesopontonia*** sp., **Periclimenaeus storchi, *Periclimenes albatrossae, Periclimenes alcocki, Periclimenes* aff. *alcocki.*

Yemen

Pontonia anachoreta.

Comoro Islands

**Periclimenes galene, *Periclimenes uniunguiculatus, *Thaumastocaris streptopus.*

Isles Glorieuses

**Onycocaris aualitica.*

Réunion

**Exopontonia malleatrix.*

SYSTEMATIC ACCOUNT

Family PALAEMONIDAE Rafinesque, 1815

Subfamily PALAEMONINAE Rafinesque, 1815

Genus ***BRACHYCARPUS*** Bate, 1888

Brachycarpus biunguiculatus (Lucas, 1846)

Figs 1 a-e, 28 a, 30

Palaemon biunguiculatus Lucas, 1846 : 45, pl. 4 fig. 4.
Brachycarpus advena Nobili 1905 : 395; 1906 : 75, pl. 4 fig. 1.
Brachycarpus biunguiculatus - KEMP, 1925 : 312. — HOLTHUIS, 1952 : 3, pl. 1.

MATERIAL EXAMINED. — **New Caledonia**. Lareignière Reef, 3-12 m, SCUBA diving, 4 September 1991, coll. and photog. (CB 1020) J.-L. MENOU : 4 ♂, 1 ♀, 1 juv. (MNHN-Na 12852-12854). — Saint Vincent Pass, 5 m, rotenone, 21 March 1990, coll. P. TIRARD : 1 ♂ (NMHN 12859).

SMIB 5 : Aztec Bank, 55 m, SCUBA diving, 14 September 1989 : 1 ♀ (MNHN-Na 12857).

Loyalty Islands. Ouvéa, La Meurthe Passage, 6-10 m, SCUBA diving, 16 November 1991, J.-L. MENOU coll. and photog. (CB 1029) : 1 ovig. ♀ (NMHN Na 12855). — Ouvéa, North Pleiades Islands, 4 m, SCUBA diving, 17 November 1991, coll. J.-L. MENOU : 2 ♂, 1 ovig. ♀ (MNHN-Na 12856).

Chesterfield Islands. MUSORSTOM 5 : stn DW 264, 25°19.69'S, 159°44.33'E, 56 m, 8 October 1985 : 1 ♂ (MNHN-Na 12858).

REMARKS. — This species has not been previously reported from New Caledonian waters. Nine of the eleven specimens have a rostral dentition of 7/4, with the first three teeth situated on the carapace. One ovigerous female has 6/3 and the single juvenile (CL 4.5 mm) has 7/4. The largest specimen, a male from Lareignière Reef, has a carapace length of 12 mm. As in other palaemonine shrimps the third thoracic pereiopod has a large outer arthrobranch and a smaller inner arthrobranch on the pleuro-coxal articulation. The paragnaths have broad rounded alae, deeply divided by a median fissure. The fourth sternite is armed with a small very acute median sternal process and the eighth, in the male, posterior to the articulations of the fifth pereipods, also has an acute median process. The endopod of the male (CL 9.5 mm) first pleopod has a well developed appendix interna with numerous cincinnuli distomedially. The medial margin has four relatively long plumose setae proximally, with about 20 stout biserrate spines distally, the distomedial margin is provided with about 9-10 spiniform setae, with short setules, and the distolateral margin with numerous short plumose setae. The appendix masculina on the second pleopod bears four long stout spines distomedially, the distal half of which are covered with microspinules, except for the acute bare tip. A smaller specimen (CL. 7.0 mm) bore only two long spines in this position.

Although apparently moderately common in the Eastern Pacific and Atlantic-Mediterranean regions, *B. biunguiculatus* has only been reported infrequently and in very small numbers from the Indo-West Pacific region, suggesting perhaps that its habitat is not well known. The present collection represents the first time that a number of specimens have been obtained from one area. Many of the specimens were collected at night.

Brachycarpus biunguiculatus has been reported as a nocturnal fish-cleaner in the West Indies (CORREDOR, 1978), but such behaviour has not yet been reported in the Indo-West Pacific region. The present record also extends the bathymetric range for this species to 56 m.

DISTRIBUTION. — Type localities : Oran and Bône, Algeria. Also known from the Red Sea; Zanzibar; Sri Lanka; Ryukyu Islands; New Caledonia; Caroline Islands; Wake and Hawaiian Islands. Also known extensively in the Eastern Pacific, Eastern and Western Atlantic and western Mediterranean regions.

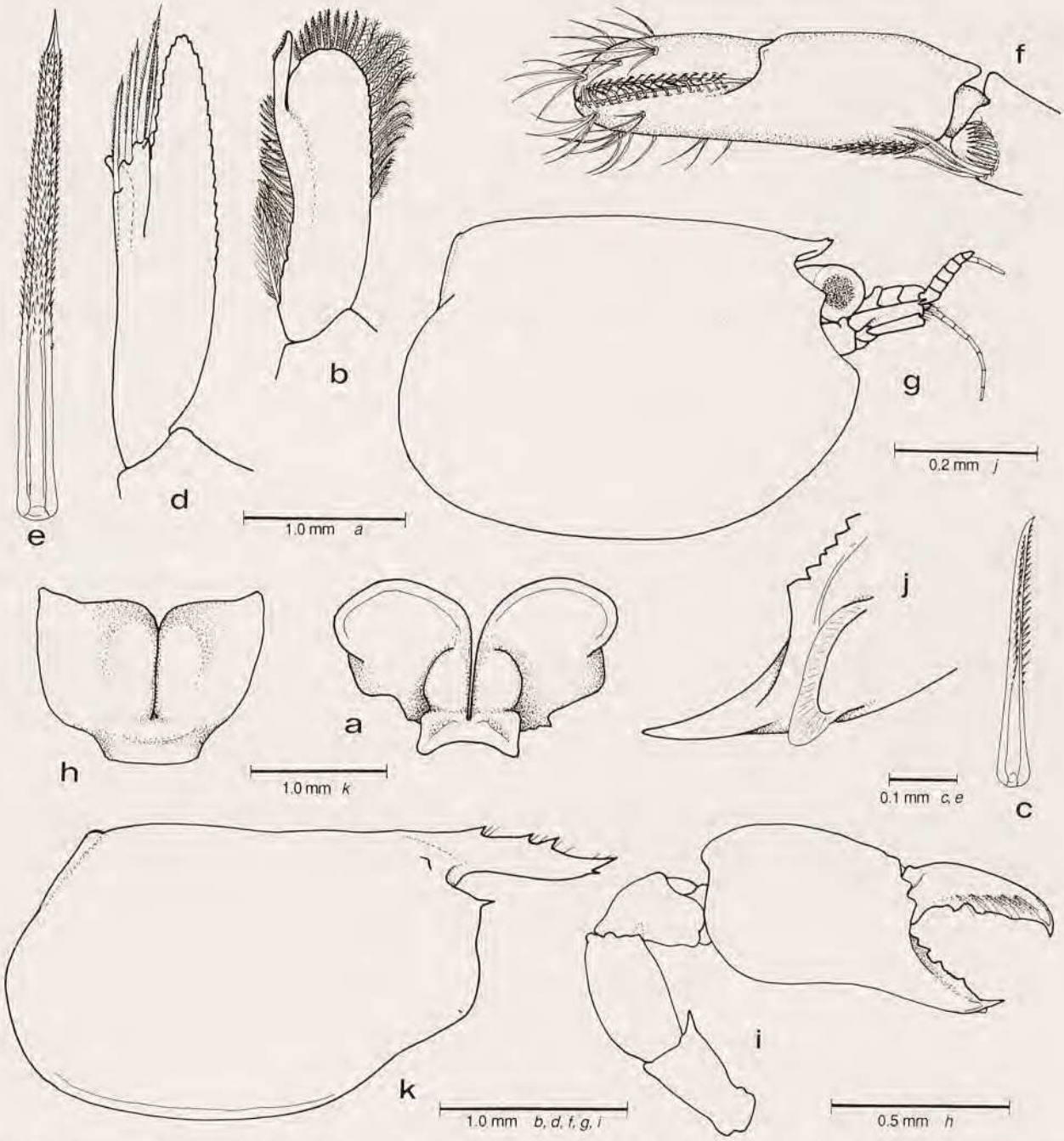

FIG. 1 a-e. — *Brachycarpus biunguiculatus* (Lucas), ♂ : **a**, paragnaths; **b**, first pleopod, endopod; **c**, same, central medial spine; **d**, second pleopod; **e**, same, appendix masculina, distal spine.

FIG. 1 f. — *Urocaridella antonbruunii* (Bruce) : first pereiopod, chela.

FIG. 1 g-j. — *Onycocaris aualitica* (Nobili), ovigerous ♀ (MNHN-Na 12871) : **g**, carapace, rostrum, eye, antennal peduncles; **h**, paragnaths; **i**, second pereiopod, medial aspect; **j**, same, lateral aspect of fixed finger.

FIG. 1 k. — *Periclimenaeus ? arabicus* (Calman), ♂ (MNHN-Na 12883) : carapace and rostrum.

Genus *LEANDER* Desmarest, 1849

Leander plumosus Bruce, 1994

Leander plumosus Bruce, 1994 : 39-48, figs 1-5, 6 A-B, pl. 2.

MATERIAL EXAMINED. — **New Caledonia**. Senez Reef, 7 m, SCUBA diving, 7 September 1992, coll. P. BOUCHET : 1 ♀ (MNHN-Na 12874).

REMARKS. — The present record represents only the third record of this conspicuous and recently described species, first reported from Bali, Indonesia. The specimen has a carapace length of 11.0 mm and a rostral dentition of 12 dorsal teeth, with the first two posterior to the orbital margin, and 11 ventral teeth. The rostrum is densely provided with short plumose setae as in the type specimens, but few are present on the body, none on the carapace, sparsely only on the dorsal second and third abdominal tergites. No trace remains of the original colour pattern.

DISTRIBUTION. — Type locality : Ari Atoll, Maldive Islands. Otherwise reported only from Bali, Indonesia.

Leander tenuicornis (Say, 1818)

Palaemon tenuicornis Say, 1818 : 249.
Leander tenuicornis - KEMP, 1925 : 302. — HOLTHUIS, 1950 : 26, figs 1-2. — LEDOYER, 1984 : 253, fig. 9. — BRUCE, 1991 : 223-227, figs 1b, 2. — CHACE & BRUCE, 1994 : 6-7.

MATERIAL EXAMINED. — **Indonesia**. Pulau Marsegu, beach seine net, 8 July 1989 : 3 ♂, 4 ♀ (3 ovig.) (MNHN-Na 12884).
Loyalty Islands. Ouvéa, La Meurthe Passage, 6-10 m, SCUBA diving, 16 November 1991, J.-L. MENOU coll. et photog. (CB 1029) : 1 ovig. ♀ (MNHN).

REMARKS. — The specimens show no differences from those reported on by BRUCE (1991) from New Caledonian waters. The largest female specimen has a carapace length of 5.7 mm and a rostral dentition of 10/6, with the first three teeth situated on the carapace. The species has been previously reported from Indonesian waters by HOLTHUIS (1950), from numerous localities. LEDOYER (1984) collected numerous specimens from intertidal depths from Nouméa, New Caledonia.

DISTRIBUTION. — Type locality : Newfoundland Banks. Also reported from the Red Sea to Japan; Philippines; Australia; New Caledonia, and the Palau Islands, south to New Zealand, as well as in the eastern and western Atlantic areas, normally in shallow algal habitats or on floating algae.

Genus *PALAEMON* Weber, 1795

Palaemon debilis Dana, 1852

Palaemon debilis Dana, 1852 : 26. — BRUCE, 1991 : 227, figs 1d, 3f.
Palaemon (Palaemon) debilis - HOLTHUIS, 1950 : 66-70, fig. 13.

MATERIAL EXAMINED. — **New Caledonia**. West coast (the Cape), in burrows in mangrove, 3 December 1992, coll. B. RICHER DE FORGES : 6 juv. (MNHN).

REMARKS. — This common species has been only recently first reported from New Caledonia (BRUCE, 1991) but has not been previously found in mangrove burrows, where its presence is presumably accidental, due to falling tide.

DISTRIBUTION. — Type locality : Hilo, Hawaiian Islands. Throughout most of the Indo-West Pacific region from the Gulf of Suez to the Tuamotu Islands.

Genus *UROCARIDELLA* Borradaile, 1915

Urocaridella antonbruunii (Bruce, 1967)

Figs 1 f, 29 a , 31

Periclimenes antonbruunii Bruce, 1967 : 45-53, figs 19-22.
Leandrites cyrtorhynchus Fujino & Miyake, 1969 : 143-149, figs 1-3. — MONOD, 1976 : 11-14, figs 42-45, 47. — BRUCE, 1991 : 223, figs 1c, 3d.
Urocaridella antonbruunii - CHACE & BRUCE, 1993 : 42.

MATERIAL EXAMINED. — **New Caledonia**. Maitre Islet, 12 m, SCUBA diving, 26 March 1989, coll. P. LABOUTE : 1 ovig. ♀ (MNHN-Na 12910). — St. Vincent Passage, 4 m, SCUBA diving, 21 April 1990, coll. P. TIRARD, rotenone : 1 ovig. ♀ (MNHN-Na 12913).

Loyalty Islands. Ouvéa, North Pleiades Islands, 4 m, SCUBA diving, 17 November 1991, coll. et photog. (CB 1033) J.-L. MENOU : 1 ♀ bopyridized (MNHN-Na 12911). — Ouvéa, La Meurthe Passage, 10 m, SCUBA diving, 16 November 1991, coll. J.-L. MENOU : 1 ovig. ♀ (MNHN-Na 12914). — Ouvéa, Mouli, 10 m, SCUBA diving, 13 November 1991, coll. and photog. (CB 1071) J.-L. MENOU : 1 ♀ (MNHN-Na 12912).

REMARKS. — This species was first recorded from New Caledonia by MONOD (1976) from Baie des Citrons, and has since been reported from Ile Ouen and Lagon Est, and from Ile des Pins by BRUCE (1991). It has not been previously recorded from the Loyalty Islands. The first specimen has a carapace length of 4.7 mm, but lacks most of the rostrum, and the right third to fifth pereiopods are all regenerating. The second specimen has a carapace length of 4.2 mm and a rostral dentition of 1 + 2 + 3/8. The mandible was moved from the specimen from Ouvéa, carapace length 5.5 mm, (with most of the rostrum missing), and is completely lacking a palp. The third thoracic segment bears a small inner and larger outer arthrobranch. The chela of the first pereiopod is about 0.6 of the carpus length, with the fingers subequal to the palm length. The fingers are rather stout, with entire sharp medial cutting edges, with a distinctive palisade of short sinuous simple submarginal setae along the medial edge. The second pereiopods of this specimen are missing. The third pereiopod has the dactyl about 4.0 times longer than the proximal depth and lacks a clearly demarcated unguis. The ventral margin is sharp, with a small distoventral eminence. The dorsum of the third abdominal segment is produced, strongly angulate and compressed, very much as in the juvenile specimen originally described as *Periclimenes antonbruunii* (BRUCE, 1967, fig. 19). The features that indicate that the holotype specimen is juvenile do therefore not include this abdominal process, and are restricted to the presence of exopods on the first and second pereiopods and the biunguiculate dactyls of the ambulatory pereiopods, the equivalent of the "dionyx" stage of some *Macrobrachium* species. The Mouli specimen is intact, carapace length 6.4 mm, with a rostral dentition of 3 + 2 + 2/12.

COLOURATION. — Largely translucent, conspicuously spotted with red over carapace and abdomen. Rostrum red spotted, with tip white. Chelae with palm red, fingers white, carpus with central region white, ends red. Ambulatory pereiopods with dactyls white, propods red.

DISTRIBUTION. — Type locality : Dzaoudzi, Pamanzi Island, Comoro Islands. Also known from Kenya; Australia; New Caledonia; Japan and Hawaii.

Urocaridella urocaridella (Holthuis, 1950)

Urocaridella gracilis Borradaile, 1915 : 210.
Leander urocaridella Holthuis, 1950 : 6, 28.

MATERIAL EXAMINED. — **Philippines**. MUSORSTOM 3 : stn CP 143, 11°29'N, 124°11'E, 205-214 m, 7 June 1985 : 1 ♂ (MNHN-Na 12925).

REMARKS. — The species has not been previously recorded from the Philippines and this specimen establishes a new bathymetric record for this species, previously reported only to 130 m. The single male specimen has a carapace length of 4.1 mm and a rostral dentition of 3 + 3 + 3/11. The ambulatory propods bear long slender spines, in marked contrast is the feeble short spines of *U. vestigialis*.

DISTRIBUTION. — Type locality : Maldive Islands. Also known from North eastern India, Andaman Islands, Burma, Malaya, Singapore, Indonesia and New Caledonia.

Subfamily PONTONIINAE Kingsley, 1878

Genus *ALTOPONTONIA* Bruce, 1990

Altopontonia disparostris Bruce, 1990

Altopontonia disparostris Bruce, 1990 : 192-202, figs 25-33, 39 k; 1991b : 390-391.

MATERIAL EXAMINED. — **New Caledonia**. BIOCAL : stn DW 44, 22°47.3'S, 167°14.3'E, 440 m, 30 August 1985 : 2 ♂, 7 ♀ (2 ovig.) (MNHN-Na 12887).

REMARKS. — All second pereiopods are lacking, but this species is readily identified without them. The largest female has a carapace length of 3.6 mm, and the larger male 2.2 mm. One female has four minute distal dorsal rostral teeth, which are not present in the other female specimens.

DISTRIBUTION. — Type locality : New Caledonia, 23°03'S, 167°19'E, 503 m. Not known from outside New Caledonian waters.

Genus *ANCHIOPONTONIA* Bruce, 1992

Anchiopontonia hurii (Holthuis, 1981)

Pontonia hurii Holthuis, 1981 : 796-800, fig. 4.
Anchiopontonia hurii - BRUCE, 1992 : 1276-1282, figs 1-4.

MATERIAL EXAMINED. — **Loyalty Islands**. CALSUB : Santal Bay, 30 m, 27 February 1989 : 1 ♂, 1 ♀ (MNHN-Na 12882).

REMARKS. — The two specimens agree closely with the previous descriptions. The male has a carapace length of 5.0 mm and the female 7.8 mm. The female has the distal rostrum acute with a small acute preterminal dorsal tooth, with a row of short setae between it and the tip. In the male the distodorsal tooth is obsolescent and the tip is less acute than in the female. The female specimen retains the right second pereipod, but the specimens otherwise back these limbs. The present report establishes a new bathymetric record for this species.

HOST. — *Spondylus* sp. (Mollusca : Lamellibranchia). Previously reported in association with *Spondylus* species.

DISTRIBUTION. — Type locality : Arno Atoll, Marshall Islands. Also known from the Tuamotu Islands and the Ryukyu Islands. Not previously recorded from New Caledonian waters.

Genus *ANCHISTUS* Borradaile, 1898

Anchistus custos (Forsskål, 1745)

Cancer custos Forsskål, 1775 : 94.
Harpilius inermis Miers, 1884 : 291, pl. 32 fig B.
Anchistus inermis - Borradaile, 1898 : 387.
Anchistus custos - Holthuis, 1952 : 105-109, figs 43-44.

Material examined. — **New Caledonia**. Saint Vincent Bay, 22 October 1961, coll. Y. Plessis : 1 ovig. ♀ (MNHN-Na 12872).

Remarks. — *Anchistus custos*, one of the first described, commonest and most widely distributed pontoniine shrimps, appears not to have been previously recorded from New Caledonia, although its range extends as far east at least to Palau and the Fijian and Solomon Islands. Previous records of this species have almost always been in association with bivalve hosts of the genus *Pinna*. The present association with *Vasum* sp. represents a new host record, but the association with a gastropod host must be considered to be highly aberrant or possibly accidental, however, a specimen was reported by Lanchester (1901) from the branchial chamber of a large but unidentified gastropod from Penang. Possibly this niche has not been sufficiently examined for the presence of commensal shrimp. The specimen is quite typical and has a carapace length of 6.2 mm.

Host. — *Vasum* sp. [Mollusca : Vasiidae].

Distribution. — Type locality : Loheia, Yemen. Widely distributed throughout the Red Sea and Indian Ocean; Singapore; Vietnam; Indonesia; Hong Kong; Taiwan; Philippines; Australia; Solomon, Caroline, and Fijian Islands.

Anchistus pectinis Kemp, 1925

Figs 2-3

Anchistus pectinis Kemp, 1925 : 327-330, figs 19-20. — Bruce, 1991 : 261-262, fig. 24; 1991 b : 378-381, figs 56-57, 71d-f.

Material examined. — **New Caledonia**. Lagoon, 10 m, SCUBA diving, 30 November 1985 : 1 ♂, 1 ovig. ♀ (MNHN-Na 12909).

Lagon : stn DW 1071, 19°54.7'S, 163°59.0'E, 26 m, dredge, 23 October 1989, coll. B. Richer de Forges : 1 ♂, 1 ovig. ♀ (MNHN-Na 12908).

Musorstom 4 : stn 147, 19°35.0'S, 163°39.6'E, 46 m, 13 September 1985 : 53 spms (11 ovig. ♀, numerous juv. or post-larval spms) (MNHN-Na 12906, 12907).

Description. — (i) Generally closely resembling *Anchistus gravieri* Kemp, 1922.

Rostrum well developed, slightly depressed, reaching to about middle of intermediate segment of antennular peduncle, broadly expanded posteriorly, compressed distally, dorsal carina obsolete, ventral carina well developed distally, convex, unarmed, tip obliquely truncate, with four small acute teeth, interspaces with short plumose setae; inferior orbital angle produced, blunt in dorsal view, antennal spine small, marginal, acute. Abdomen as in *A. gravieri*. Telson about 2.7 times longer than wide, with two pairs of small dorsal spines at 0.7 and 0.85 of telson length; posterior margin with three pairs of marginal posterior spines, lateral spines small, similar to dorsal spines, intermediate spines stout, distally acute, about 0.08 of telson length, submedian spines about 0.8 of submedian spine length, slender, medially feebly setulose.

Antennule with proximal segment broad, about 1.4 times longer than wide, distolateral margin strongly produced, with plumose setae, with minute acute distolateral tooth; stylocerite distally acute; medial margin without ventral tooth; upper antennular flagellum with proximal five segments of rami fused, shorter ramus with two free segments, lower flagellum short, with 10 segments.

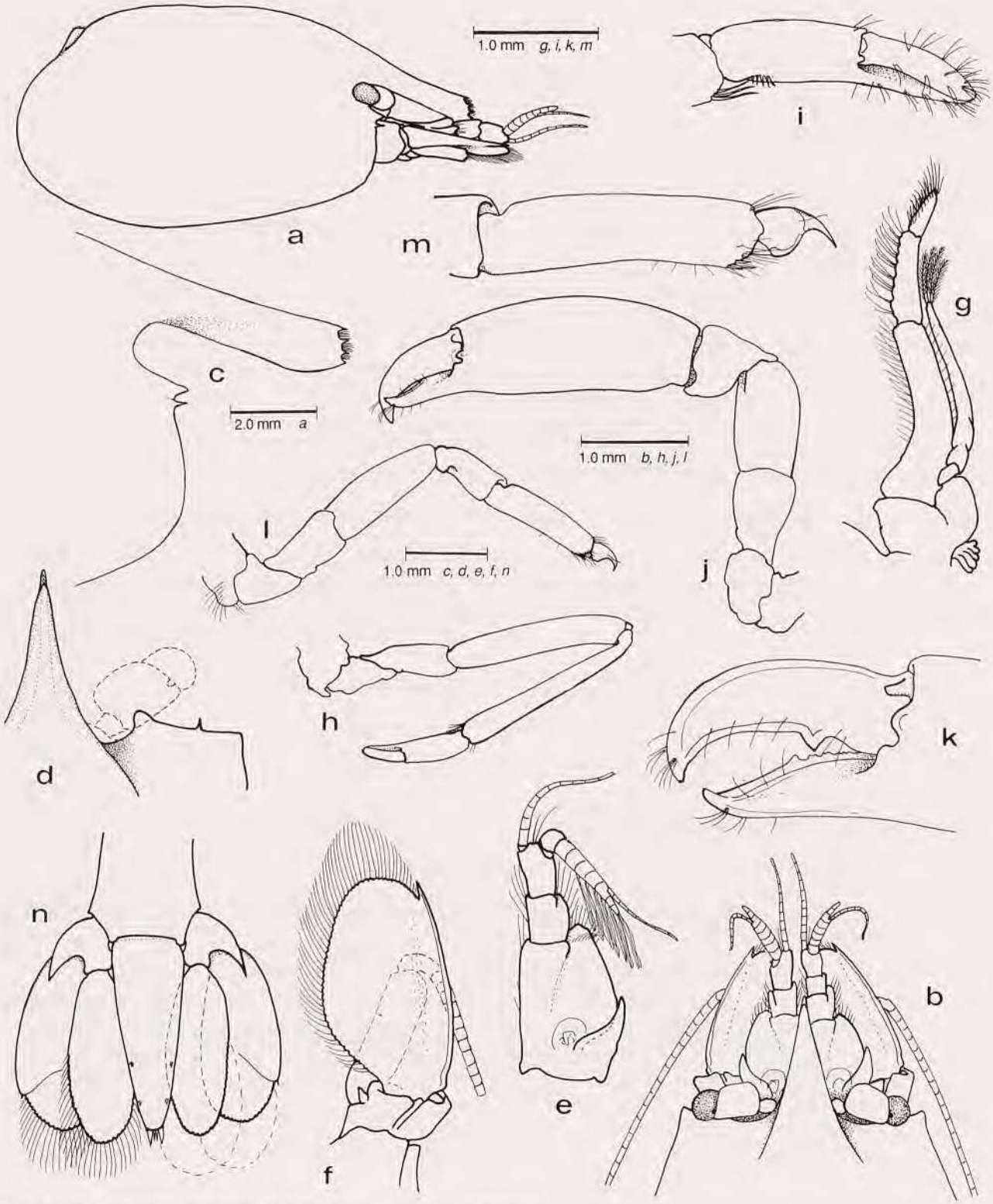

FIG. 2. — *Anchistus pectinis* Kemp, 1922, ovig. ♀ (MNHN-Na 12908) : **a**, carapace, rostrum, eye and antennae; **b**, anterior carapace, eyes, antennae, dorsal; **c**, anterior carapace, rostrum, lateral; **d**, same, dorsal; **e**, antennule; **f**, antenna; **g**, third maxilliped; **h**, first pereiopod; **i**, same, chela; **j**, second pereiopod; **k**, same, fingers; **l**, third pereiopod; **m**, same, propod, dactyl; **n**, caudal fan.

Antenna with basicerite unarmed; scaphocerite broad, about 1.8 times longer than wide, distolateral spine slender, not exceeding lamella.

Mouthparts mainly undissected. Third maxilliped slender, with ischiomerus completely fused to basis, penultimate segment slender, about 3.0 times longer than proximal width, about 0.5 of antepenultimate segment length. Terminal segment about 0.5 of penultimate segment length. Third thoracic sternite broad, with low transverse unarmed ridge.

First pereiopods slender; chela with palm subcylindrical, feebly compressed, about 2.4 times longer than deep, fingers about 0.8 of palm length, broad, spatulate, with finely denticulate lateral cutting edge, distally rounded, without terminal tooth; carpus about 1.9 times chela length, 1.1 times merus length.

Second pereiopod (left) small; chela about 0.8 of carapace length, palm subcylindrical, slightly swollen centrally, about 2.5 times longer than deep, fingers about 0.4 of palm length, dactylus strongly curved with stout acute tip, distinctly over-reaching fixed finger, cutting edge with single, feebly recurved, acute tooth, fixed finger with single small acute tooth at about half length, with five smaller proximal denticles, distal two bicuspid, proximal segments, as in *A. gravieri* but more robust.

Ambulatory pereiopods robust, third with propod 4.0 times longer than deep, distoventral angle with three well developed slender spines, numerous simple setae; dactylus compressed, corpus about as deep as maximum length, ventral margin feebly convex, without accessory tooth, unguis clearly demarcated, strongly deflexed, maximum length about 1.2 times corpus depth, small area of proximal dorsal surface densely covered with short transverse ridges (possibly transverse rows of microspinules?).

Uropods with protopodite strongly acutely produced posterolaterally; exopod with lateral margin convex, with small mobile dislolateral spinule only.

(ii) ? post-larva, stn. 147. Generally a miniature of the adult, carapace length about 1.1 mm, rostrum 0.75 of carapace length, compressed, not exceeding proximal segment of antennular peduncle, slightly depressed, about 5.0 times longer than central depth, subuniform, dorsal border convex, ventral margin concave, both glabrous, unarmed, tip obliquely truncate distally, acute ventrally, with two minute denticles proximodorsally, lower interdental space with two short setae, dorsal seta plumose, ventral simple. Cornea about 0.28 of carapace length, hemispherical, well pigmented, with dorsal accessory pigment spot, diameter about 0.6 of stalk length, stalk depressed, about 1.2 times longer than wide. Antennule with distolateral angle of proximal peduncular segment with well developed acute tooth, upper flagellum with rami fused proximally, short free ramus with two segments, longer free ramus with five segments; lower flagellum with eight segments. Basicerite laterally unarmed. Chelae of first pereiopods as in adult. Second pereiopods generally markedly unequal in juvenile (subequal in ovigerous females). Chela as in adult, dactyl with long slender hooked tip; fixed finger with small acute tip. Ambulatory pereiopods with dactyl distinctly more elongate than in associated adults, unguis clearly demarcated, subequal to dorsal length of corpus, acute, curved, about 3.0 times longer than proximal width, dorsal surface microspinulate; corpus compressed, about 1.4 times longer than proximal depth, with very large acute distoventral accessory tooth, dorsal surface devoid of spinules or ridges, with lateral sensory seta; propod with pair of slender simple distoventral spines, about 0.45 of dactyl length, with single similar distal ventral spine. Second pleopods without appendix masculina on endopods. Uropods with protopodite acutely produced posterolaterally, exopod with small mobile distolateral spine, without distolateral tooth. Telson with dorsal spines similar to adult, intermediate posterior spines long slender, not inflated.

(iii) 1 ♂, 1 ovig. ♀, lagon, 10 m. The female has a carapace length of 6.0 mm, with the rostrum distally minutely trifid. The third ambulatory dactyl is simple, the propod with three small distoventral spines. The male is very small, carapace length 2.2 mm, with the distal rostrum squarely bidentate, the teeth separated by a deeply concave notch. The ambulatory dactyl is short with the corpus strongly compressed, with a minute pretermal ventral accessory denticle, unguis distinct with microspinules proximally and transverse ridges distally.

MEASUREMENTS (mm). — Ovigerous female, stn DW 1071 : carapace length, 7.7; carapace and rostrum, 9.75; total body length (approx.), 29.0; left second pereiopod, chela, 6.5.

HOSTS. — *Amusium balloti* (Bernardi), (i) (ii); *Semipallium vexillum* (Reeve), (iii), [Mollusca : Pectinidae].

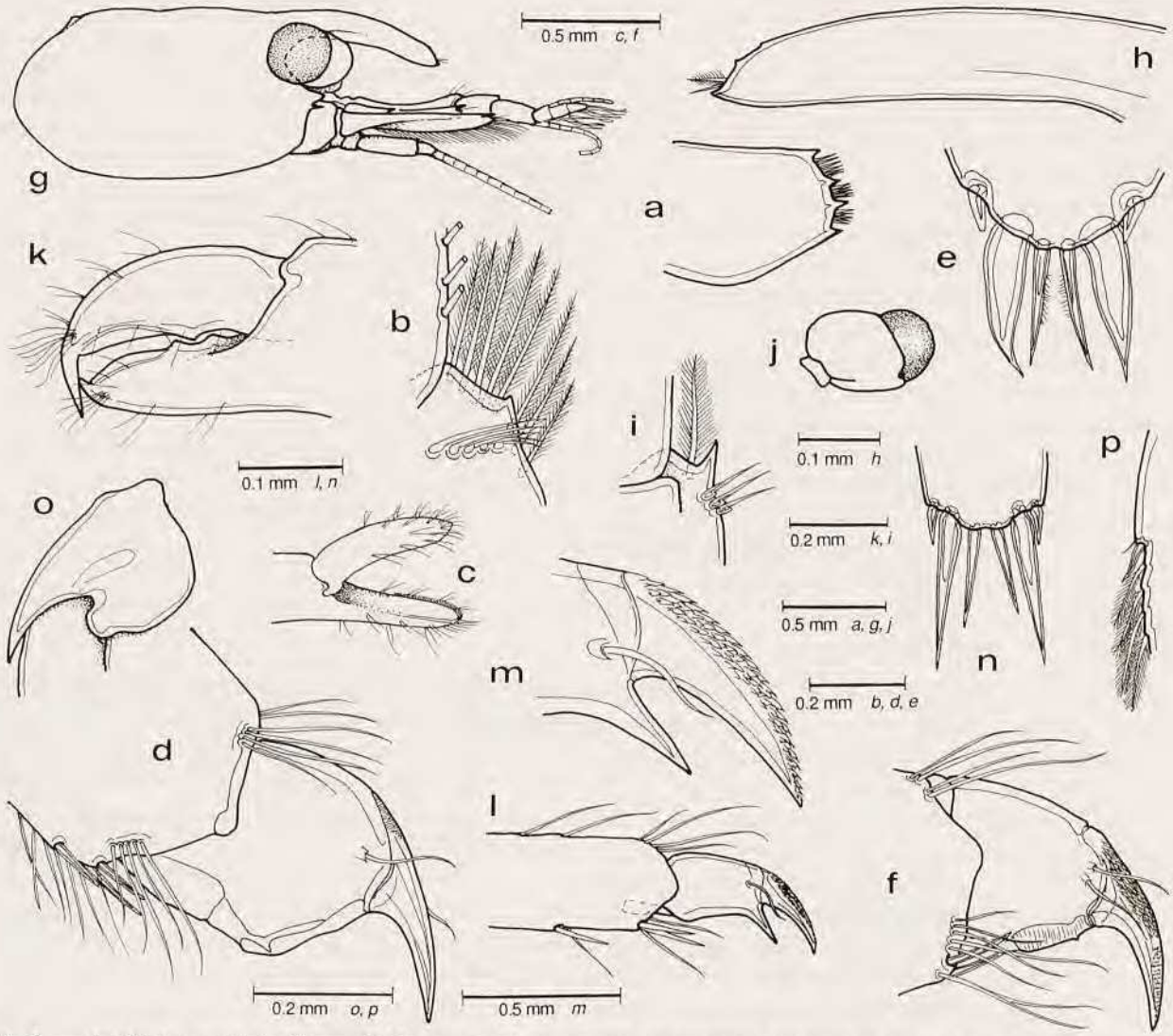

FIG. 3. — *Anchistus pectinis* Kemp, 1922 : **a**, tip of rostrum; **b**, distolateral angle of proximal segment of antennular peduncle; **c**, first pereiopod, fingers of chela; **d**, third pereiopod, distal propod, dactyl; **e**, posterior telson spines; **f**, third pereiopod, distal propod, dactyl; **g**, carapace, eyes, antennae; **h**, rostrum; **i**, distolateral angle of proximal segment of antennular peduncle; **j**, eye, dorsal; **k**, second pereiopod, finger of chela; **l**, third pereipod, distal propod, dactyl; **m**, same, distal dactyl; **n**, posterior telson spines; **o**, uropod, protopodite; **p**, same, exopod, posterolateral angle.

a-e, ovigerous female. f, male. g-p, ? post-larva (MNHN-Na 12906, 12907).

REMARKS. — Numerous examples have been previously reported from New Caledonian waters, from 10-35 m, in association with *Amusium balloti*. The association with *Semipallium vexillum* represents a new host record. The specimens from *Semipallium* agree exactly with the material obtained from *Amusium*. The ambulatory dactyls appear to be highly variable and require further study. From the presently available material, it appears that the accessory tooth is at first well developed and is progressively reduced in size with growth, ultimately being lost. Similarly, the unguis may be initially covered with microspinules but these being lost with growth or through abrasion (possibly be replaced during ecdysis). The transverse ridges may represent the lines of origin of the abraded microspinules.

The morphology of the distal rostrum of the post-larval specimen indicates that the larger acute ventral tooth is the true rostral tip and that the smaller dorsal teeth represent the dorsal series of teeth. In some adult specimens, in

which the rostrum is distally squarely truncate, it may be obscure which tooth represents the tip of the rostrum. The post-larval specimen clearly exhibits most of the feature that characterise the genus and even shows unequal development of the second pereiopod chelae at this early stage, although this may evidently be lost in adult females.

DISTRIBUTION. — Type locality : Nancowry, Nicobar Islands. Also reported from Zanzibar; Japan; Queensland, Australia, and New Caledonia. Reported from depths to 110 m (BRUCE, 1991b).

Genus *CLIMENIPERAEUS* nov.

DEFINITION. — Small sized shrimps of subcylindrical body form. Rostrum well developed, compressed, dorsally dentate, lateral carinae broadly expanded, with large acute supraocular teeth. Carapace smooth, epigastric, supraorbital and hepatic spines absent, inferior orbital angle produced, antennal spine present, anterolateral angle of branchiostegite not produced, posterolateral angle of sixth segment acutely produced. Telson with two pairs of dorsal spines, three pairs of posterior spines. Antennae reduced, antennule with short flagella, antenna with basicerite unarmed, scaphocerite well developed. Mandible without palp, incisor process distally tridentate. Maxilla with bifid basal endite, palp normal. First maxilliped with simple palp, basal and coxal endites distinct, exopod well developed, with normal flagellum and caridean lobe, epipod bilobed. Second maxilliped with normal endopod and exopod, epipod subrectangular, without podobranch. Third maxilliped with endopod slender, ischiomerus and basis completely fused, exopod well developed with plumose setae distally, coxa with oval lateral plate, without arthrobranch. Fourth thoracic sternite without median process. First pereiopod slender, chela with simple fingers. Second pereiopods well developed with large, unequal, dissimilar chelae; major chela with dactyl lacking molar process, fingers with mechanism of opposing fossae; minor chela with cutting edges of fingers unarmed, dactyl with bilateral laminar expansions. Ambulatory pereiopods with propods strongly spinulate ventrally; dactyl biunguiculate, with additional accessory denticles. Male second pleopod with corpus of appendix masculina not reduced. Uropods with protopodite unarmed posteroterally; exopod strongly spinulate distolaterally.

TYPE SPECIES. — *Periclimenaeus truncoideus* Chace & Bruce, 1993.

SYSTEMATIC POSITION. — The genus *Climeniperaeus* is closely related to the genus *Periclimenaeus* Borradaile, 1915, in which the currently recognized species was previously included. The genus *Periclimenaeus* is characterized by the presence, on the chela of the major second pereiopod only, of a molar process on the cutting edge of the dactylus, which occludes into a corresponding fossa on the cutting edge of the fixed finger. This mechanism is not present in *Climeniperaeus*, but is replaced by a mechanism consisting of two deep opposing fossae, without any dactylar molar process. On the minor second pereiopod the fingers are also distinct from those of *Periclimenaeus*, the twisted dactyl possessing a conspicuous lateral laminar expansion, with a smaller median expansion, and with an entire cutting edge, quite unlike this dactyl in *Periclimenaeus*, in some species of which it is laminar, but not twisted, and with serrated or dentate cutting edge. Another feature that distinguish *Climeniperaeus* from *Periclimenaeus* are the large supraocular teeth. These are here distinguished from the supraorbital tubercles or acute teeth that may be present in some *Periclimenaeus* species. In these, tubercles or small acute teeth ("spines") arise directly from the carapace, posteriorly to the level of the posterior orbital margin, and not from the edge of a posterior supraorbital expansion of the lateral carina of the rostrum, in a position above rather than posterior to the eye. The spinulation of the distolateral margin of the exopod of the uropod is a character that is shared with some species of *Periclimenaeus* and also with *Apopontonia* Bruce.

ETYMOLOGY. — Anagram of *Periclimenaeus*, a pontoniine generic name first used by BORRADAILE (1915).

INCLUDED SPECIES. — Only one species is now referred to the genus *Climeniperaeus* : *C. truncoideus* (Chace & Bruce, 1993) comb. nov., originally referred to *Periclimenaeus*.

In the original description of *P. truncoideus* by CHACE and BRUCE (1993) the species was distinguished from *Periclimenaeus truncatus* (Rathbun), with which the original specimens had initially been identified (HOLTHUIS, 1952). Although closely similar in several features, this species is not included in the genus *Perimeniclaeus* as the chelae of the second pereiopods lack the characteristic features of the new genus. The fingers of the major chela also lack the dactylar molar process (CHACE, pers. comm.) and fixed finger fossa, a mechanism diagnostic of *Periclimenaeus* s. str., so that it should not be placed in that genus. The original description by RATHBUN (1905), in which the specimen is referred to *Coralliocaris*, is brief and inadequately illustrated, with only a figure of the rostrum and a small photograph of the whole shrimp. Its correct placement requires further examinations of the only known holotype specimen from the Hawaiian Islands, preserved in the collection of the National Museum of Natural History, Washington.

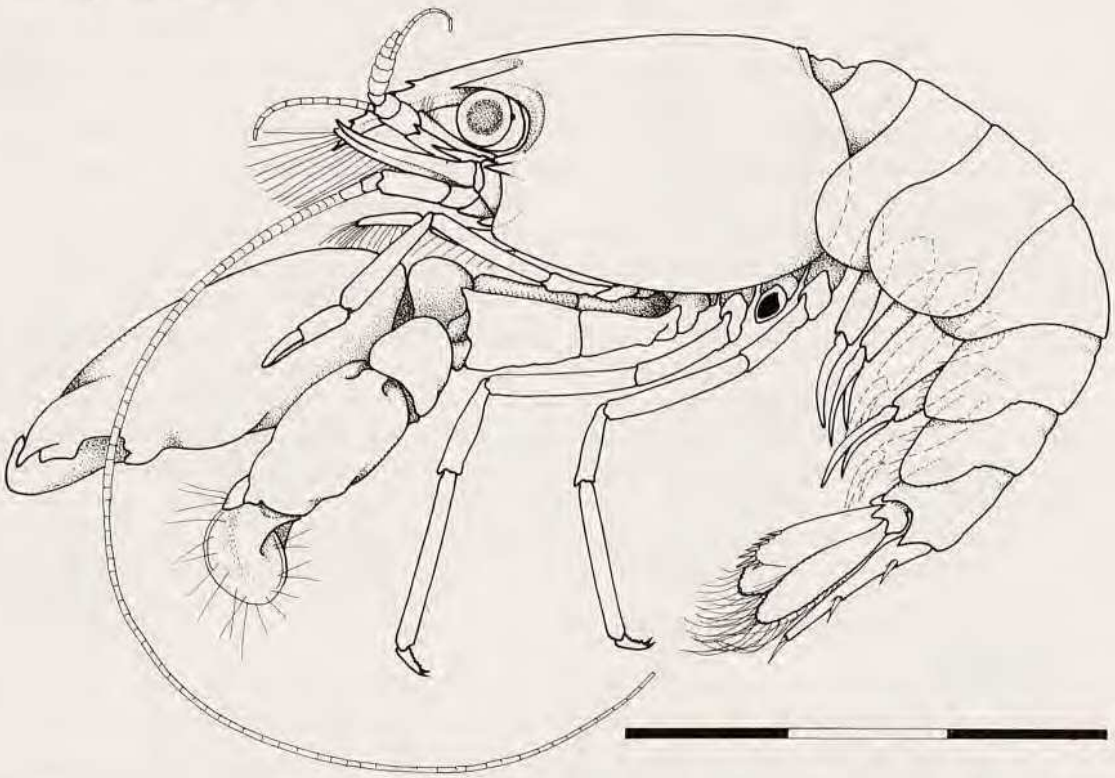

FIG. 4. — *Climeniperaeus truncoideus* (Chace & Bruce) comb. nov., ♂ (MNHN-Na 12846), Philippines, MUSORSTOM 3, stn DR 117, 92-97 m. Scale divisions in millimeters.

Climeniperaeus truncoideus comb. nov.

Figs 4-5

Periclimenaeus truncatus - Holthuis, 1952 : 117-121, figs 48-50. — BRUCE, 1976 : 473, 474; 1981 : 211-213, figs 6, 17d.

Periclimenaeus truncoideus - CHACE & BRUCE, 1993 : 93-94.

Non *Coralliocaris truncata* Rathbun, 1906 : 920, fig. 70, pl. 24, fig. 2.

MATERIAL EXAMINED. — **Philippines**. MUSORSTOM 3 : stn DR 117, 12°31'N, 120°39'E, 92-97 m, 3 June 1985 : 1 ♂, 1 ♀, 1 ovig. ♀ (MNHN-Na 12846). — Stn DR 127, 12°03'N, 122°06'E, 56 m, 6 June 1985 : 1 ovig. ♀ (MNHN-Na 11152).

REMARKS. — The male specimen from stn DR 117 is in good condition with both second pereiopods (minor pereiopod detached). The ovigerous female is in poor condition without pereiopods, but readily identifiable by the

morphology of carapace and rostrum. The non-ovigerous female is in good condition but has only one first and one third pereiopod. The ovigerous female from stn DR 137 lacks the major second pereiopod.

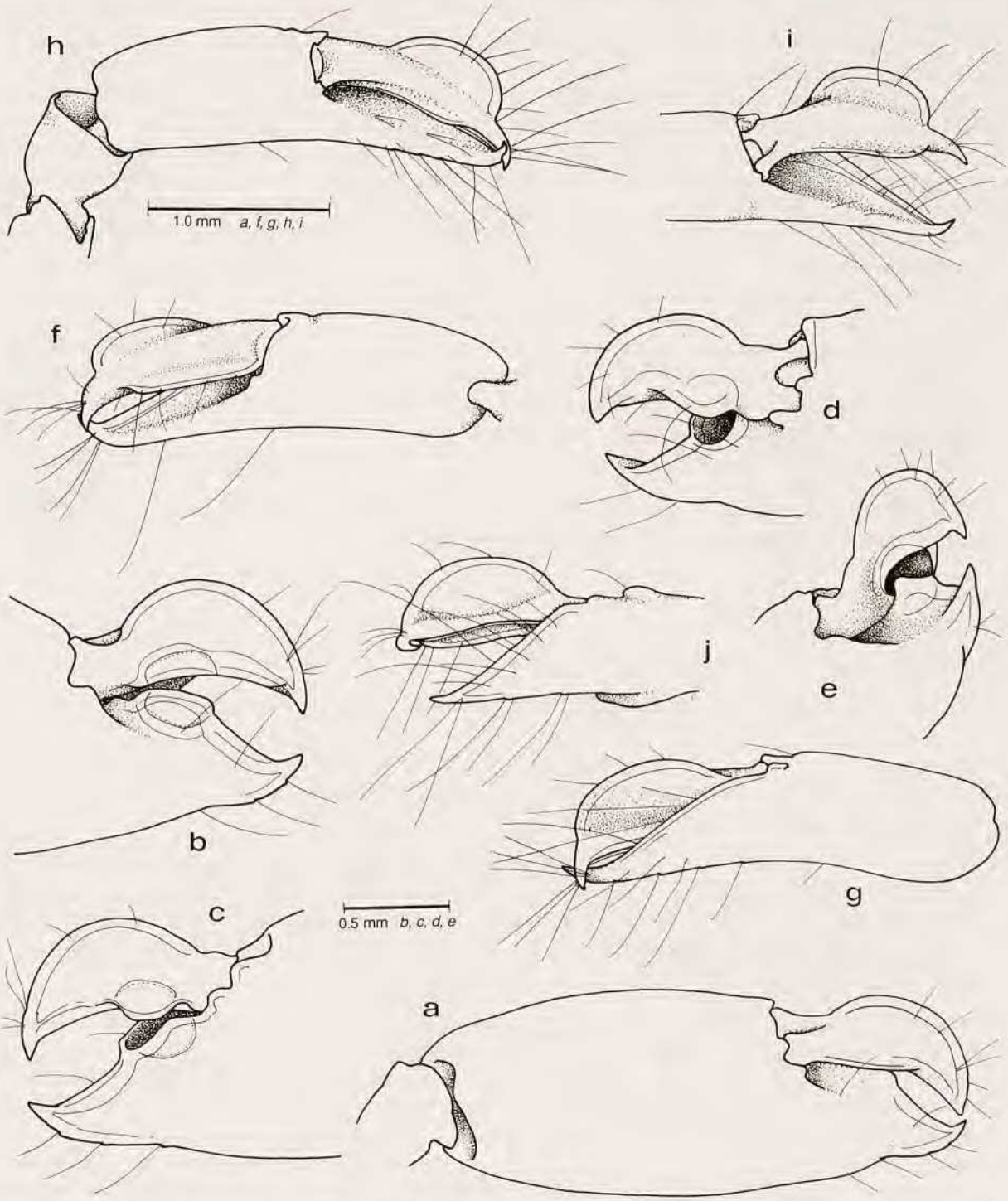

FIG. 5. — *Climeniperaeus truncoideus* (Chace & Bruce) comb. nov. : **a**, major second pereiopod, chela; **b**, same, fingers, medial; **c**, same, lateral; **d**, same, showing fixed finger fossa; **e**, same, showing dactylar fossa; **f**, minor second pereiopod, chela; **g**, same, lateral; **h**, same, medial; **i**, same, finger, medial; **j**, same, lateral.
a-f, male. g-j, female (MNHN-Na 12846).

The male specimen has a carapace length of 2.0 mm and a rostral dentition of 5/0. The chelae of the second pereiopods are exactly as in the holotype specimen illustrated by HOLTHUIS (1952). The major chela is about 1.6 times the postorbital carapace length, palm about 1.8 times longer than deep, oval in section, slightly swollen centrally, smooth and glabrous. The fingers are robust, about 0.5 of the palm length. The dactyl is about 3.5 times longer than the proximal width, stout, with a stout acute tip; distal cutting edge entire, proximal cutting edge expanded to enclose deep fossa with raised sharp edges. Fixed finger similar, about 1.2 times longer than proximal depth, with similar fossa opposing dactylar fossa. The fingers bear sparse simple setae. The minor second pereiopod is about 1.2 times the carapace length and 1.4 of the major carapace length. The palm is about 2.0 times longer than the central depth, oval in section, feebly swollen centrally, smooth, glabrous. The fingers are long and slender, about subequal to palm length, with acute hooked tips. The dactyl is about 5.0 times longer than its proximal depth, with a very large broad laminar dorsolateral flange and smaller, narrow ventrolateral flange, with the cutting edge entire. The fixed finger is about 1.8 times longer than the proximal depth, with an entire convex cutting edge, that opposes the cutting edge of the dactyl with a shearing action. Both fingers are provided with sparse, very long, simple setae. The female specimens lack the major second pereiopod, but, when present, the minor chela is essentially the same as in the male.

The female specimens have a rostral dentition of 0 + 4-5/0, in contrast to previously described material, in which the dentitions is 0 + 7-8/0. The proximal teeth are noticeably smaller in the earlier specimens. The present specimens are from 2.0-2.5 mm carapace length, the larger specimen having a rostral dentition of 0 + 4/0. Previously reported from 70-76 m in the Philippines (BRUCE, 1991).

The specimen reported from Zanzibar (BRUCE, 1976) was associated with the sponge *Biemna fortis* (Topsent).

DISTRIBUTION. — Type locality : off Kai Besar, Kai Islands, Indonesia, at 93 m. Other records only from Ternate Indonesia, at 4 m; the Philippines, 70-76 m; and Zanzibar, at 2 m.

Genus ***CONCHODYTES*** Peters, 1852

Conchodytes philippinensis sp. nov.

Fig. 6, 29 b

MATERIAL EXAMINED. — **Philippines**. March 1985, SCUBA diving, few meters, coll. P. BOUCHET : 1 ♂, holotype (MNHN-Na 10279).

DIAGNOSIS. — A typical species of *Conchodytes*; first pereiopods with carpus slightly longer than merus; second pereiopods similar, chelae of fingers with rounded teeth, dactylus without dorsal carina; ambulatory pereiopods with dactyl bearing well developed distal accessory tooth, basal process feebly developed, without denticle; telson with three pairs of dorsal spines at 0.2, 0.7 and 0.9 of telson length, posterial margin with two pairs of inflated subequal spines.

REMARKS. — The new species, *C. philippinensis*, seems so similar to the other species of the genus that a detailed description appears superfluous. The following additional points may be noted.

The proximal segment of the antennular peduncle has the distolateral angle acutely produced; the laterally projecting stylocerite is bluntly rounded distally. The first maxilliped has the basal and coxal endites broadly expanded and almost completely fused, with only a feeble concavity of the medial margin indicating their separation in the unflattened appendage, with a dense oblique band of setae extending across the dorsal surface of the coxal portion. The caridean lobe of the exopod is well developed and the epipod is distinctly bilobed with a larger posterior lobe. The third maxilliped has the ischiomeral and basal segments completely fused, without any indication of a line of junction, the medial margin is densely setose; the penultimate segment is about 1.6 times longer than broad, about 0.33 of the combined antepenultimate segment length: the basis and coxa are inclined medially, the coxae are laterally placed, separated by a broad unarmed sternite, with large oval lateral plates.

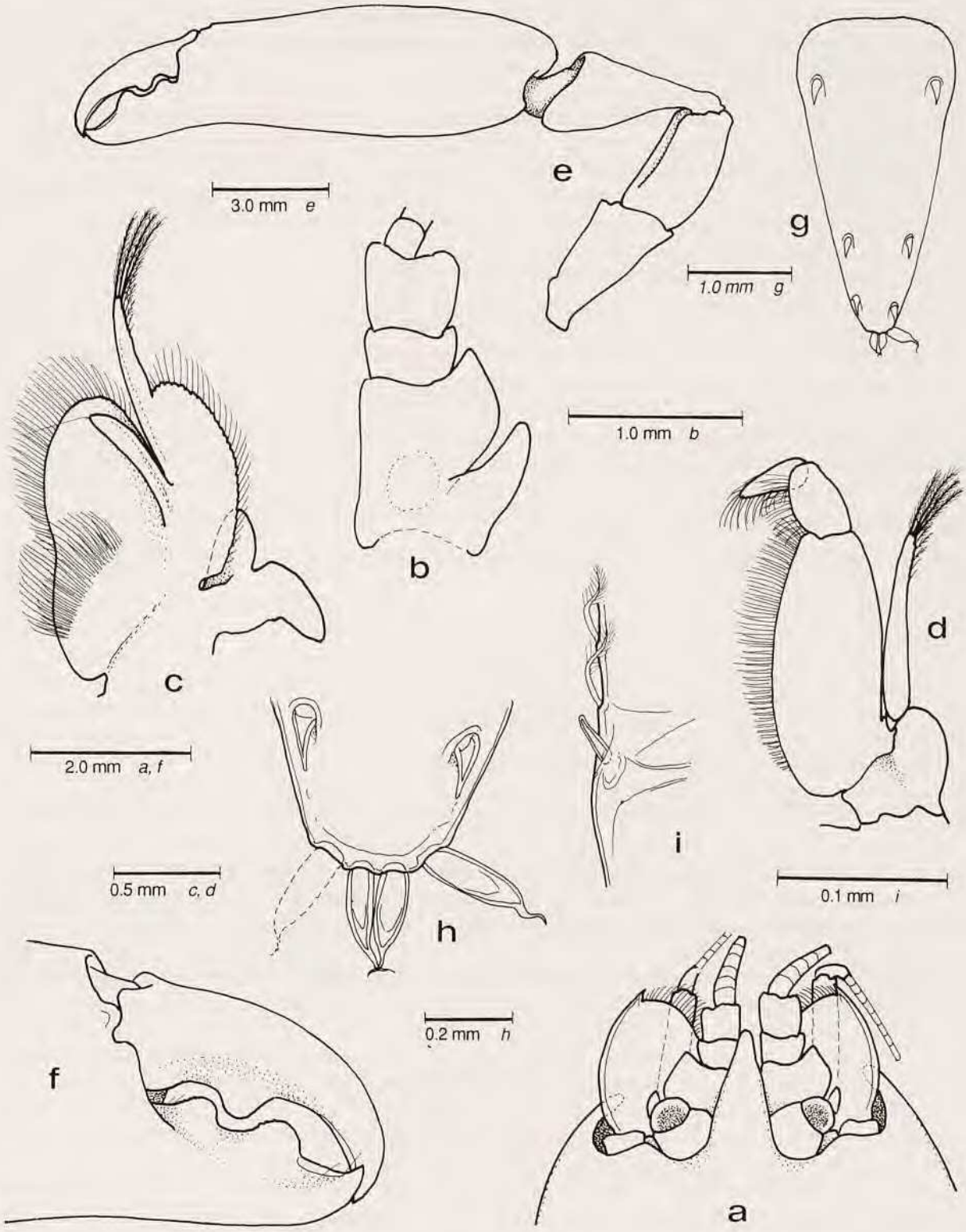

FIG. 6. — *Conchodytes philippinensis* sp. nov., ♀, holotype (MNHN-Na 10279), Philippines : **a**, anterior carapace, rostrum, eyes, antennae; **b**, antennular peduncle; **c**, first maxilliped; **d**, third maxilliped; **e**, second pereiopod; **f**, same, finger of chela; **g**, telson; **h**, same, posterior spines; **i**, uropod, posterolateral angle of exopod.

The second pereiopods are similar, dactylus with single large blunt tooth, with the chela of the minor pereiopod about 0.8 of the length of the major chela. The dorsal telson spines are rather small, about 0.07 of the telson length. The exopod of the uropod bears a small distolateral spinule but lacks a posterolateral tooth.

SYSTEMATIC POSITION. — *Conchodytes philippinensis* is most closely related to *C. nipponensis* (de Haan) and *C. maculatus* Bruce. It resembles the former in the disposition of the telson spines, with three pairs situated on the dorsum and two on the posterior margin, but may be distinguished by the absence of a small tooth on the basal process of the ambulatory dactyl. The dorsal telson spines are larger and the central pair is about equidistant from the anterior and posterior pairs in *C. nipponensis*. *C. philippinensis* resembles *C. maculatus* in the absence of a small tooth on the basal process of the ambulatory dactyl, but differs from it in the disposition of the telson spines, as described above, *C. maculatus* having the usual two pairs of dorsal spines and three pairs of posterior marginal spines. *C. philippinensis* also lacks the compressed carinate dactyl of the second pereiopods as found in *C. maculatus*, and the distolateral angle of the proximal segment of the antennular peduncle is more bluntly rounded. *Conchodytes maculatus* also lacks the inflated posterior telson spines, which are distinctly smaller than the dorsal telson spines, these spines being distinctly larger in *C. philippinensis*.

Dr C.H. FRANSEN (personal communication) has also kindly pointed out that SUZUKI (1971) has reported that "A small tooth found on the basal protuberance of the dactylus of the last three pairs of pereiopods seems not to be an essential character to distinguish this species (*C. nipponensis*) from other congeners, because the presence of this tooth is individually not constant ....". *Conchodytes nipponensis* may be more reliably distinguished from *C. philippinensis* by the presence of two distinct teeth on the dactyls of the second pereiopods.

ETYMOLOGY. — The specific epithet is based on the only significant item recorded of the capture of this specimen.

Genus ***DASYCARIS*** Kemp, 1922

Dasycaris zanzibarica Bruce, 1973

Dascycaris zanzibarica Bruce, 1973 : 247-257, figs 1-6; 1991 : 265-266, fig. 27.

MATERIAL EXAMINED. — **New Caledonia**. 1 mile east of Kouaré, SCUBA diving, 32 m : 2 ovig. ♀ (MNHN-Na 12873).

REMARKS. — This species has been previously recorded from New Caledonian waters at the following localities : Surprise Atoll, North Lagoon, and Brun Islet (BRUCE, 1991). The specimens had carapace lengths of 5.8, 5.5 mm. The present report represents a new bathymetric record for this species.

DISTRIBUTION. — Type locality : Pungume Reef, Zanzibar. Otherwise reported only from New Caledonia and the Great Barrier Reef, Australia.

Genus ***EXOPONTONIA*** Bruce, 1988

Exopontonia malleatrix Bruce, 1988

Exopontonia malleatrix Bruce, 1988 : 123-130, figs 1-5.

MATERIAL EXAMINED. — **Réunion**. *"Marion Dufresne"*, cruise MD/32 : stn CP 97, 19°41.4'S, 54°08.7'E, (just outside Le Port), 55 m, beam trawl, 28 August 1982 : 1 ♀ (MNHN-Na 11041).

REMARKS. — The single example, the host of which was unfortunately not recorded, in good condition, incomplete, agrees fully with the original description. The left first pereiopod has been detached and examined in

detail and is exactly as in the type material. This unusual appendage is diagnostic for this genus and species, which is otherwise known only from the type material. The equally diagnostic major second pereiopod is also attached but the minor pereiopod is missing. Only the left third ambulatory pereiopod is preserved. The specimen has a carapace length of 2.4 mm and a rostral dentition of 2/0. The present record indicates a considerable bathymetric range for the species, the holotype having been collected from exposed reef flat.

DISTRIBUTION. — Type locality : Ashmore Reef, Timor Sea, intertidal. Otherwise known only from the present specimen.

Genus *MESOPONTONIA* Bruce, 1967

Mesopontonia brucei Burukovsky, 1991

Fig. 7

Mesopontonia brucei Burukovsky, 1991 : 38, fig. 1 *8-18*.

MATERIAL EXAMINED. — **SW Indian Ocean**. *"Vityaz"* : stn 2753, 33°16'S, 43°53'E, 415-460 m, Sigsbee trawl, 22 December 1988 : 1 ovig. ♀, holotype, catalogue number ZI 1/84264; 1 ovig. ♀, 2 ♂, paratypes, catalogue number ZI 2/84265.

REMARKS. — Through the kindness of Dr A.V. SMIRNOV, it has been possible to examine the type material of *M. brucei* for further comparison with other species of the genus. The specimens are held in the collection of the Zoological Institute, St. Petersburg.

The holotype specimen is in good condition and complete, with both second pereiopods attached. The male specimens both lack the major second pereiopods and the second ovigerous female is extensively damaged, lacking most pereiopods.

In addition to the data provided in the original description, the following points may be noted. The epigastric tooth appears articulated and is distinctly separated from the first rostral tooth, which is also feebly articulate and situated posterior to the posterior orbital margin. The dorsal carina is not appreciably posteriorly elevated and is very feebly convex; the dorsal teeth are broadly acute, usually separated by an interval with only two short plumose setae. The ventral teeth are similar. In all specimens except one, the proximal ventral margin is without setae, presumably lost through abrasion. In the damaged female, a double row of submarginal plumose setae is distinct. The hepatic spine is well developed, but not extending to level of the anterior carapace margin. In the first pereiopod the fingers are slender, tapering, about 0.5 of the palm length, with simple entire cutting edges, the tip of the dactyl with a small laminar expansion. Chelae of second pereiopods, in female holotype, small : major chela about 0.75 of carapace length, minor chela 0.6 respectively. The minor chela is about 0.83 of the major chela length. In the major chela the dactyl is about 0.55 of the palm length, in the minor chela 0.65, with the carpus 0.58 and 0.92 respectively. The fingers of the major chela have two small subacute teeth proximally on each cutting edge, the distal cutting edge sharp, entire, with only a single obsolescent tooth proximally on each finger of the minor chela. The dactylus is without any trace of a dorsolateral flange. The ambulatory pereiopods are slender, with the third pereiopod propod about 0.75 of the carapace length, 13.0 times longer than proximal width, with a single long distoventral spine, a pair of slightly shorter subdistal spines and a single long ventral spine. The dactyl is about 0.17 of the propod length, slender, with a feebly demarcated unguis; unguis slender, about 4.0 times longer than basal width, feebly curved, 0.66 of corpus length; corpus compressed, 3.0 times longer than proximal depth, feebly tapering distally, ventral margin sharp, feebly concave, with slender acute accessory tooth distally, about 0.33 of unguis length. Fourth and fifth pereiopods similar; fifth propod with numerous cleaning setae distolaterally. Uropods with protopodite posterolaterally blunt, exopod with strong distolateral tooth with large mobile spine medially.

Full assessment of the systematic position of *M. brucei* is obscured by the lack of knowledge of the male second pereiopods, which may be better developed than those of the female. *Mesopontonia brucei* is provisionally considered to be most closely related to *M. gorgoniophila* Bruce.

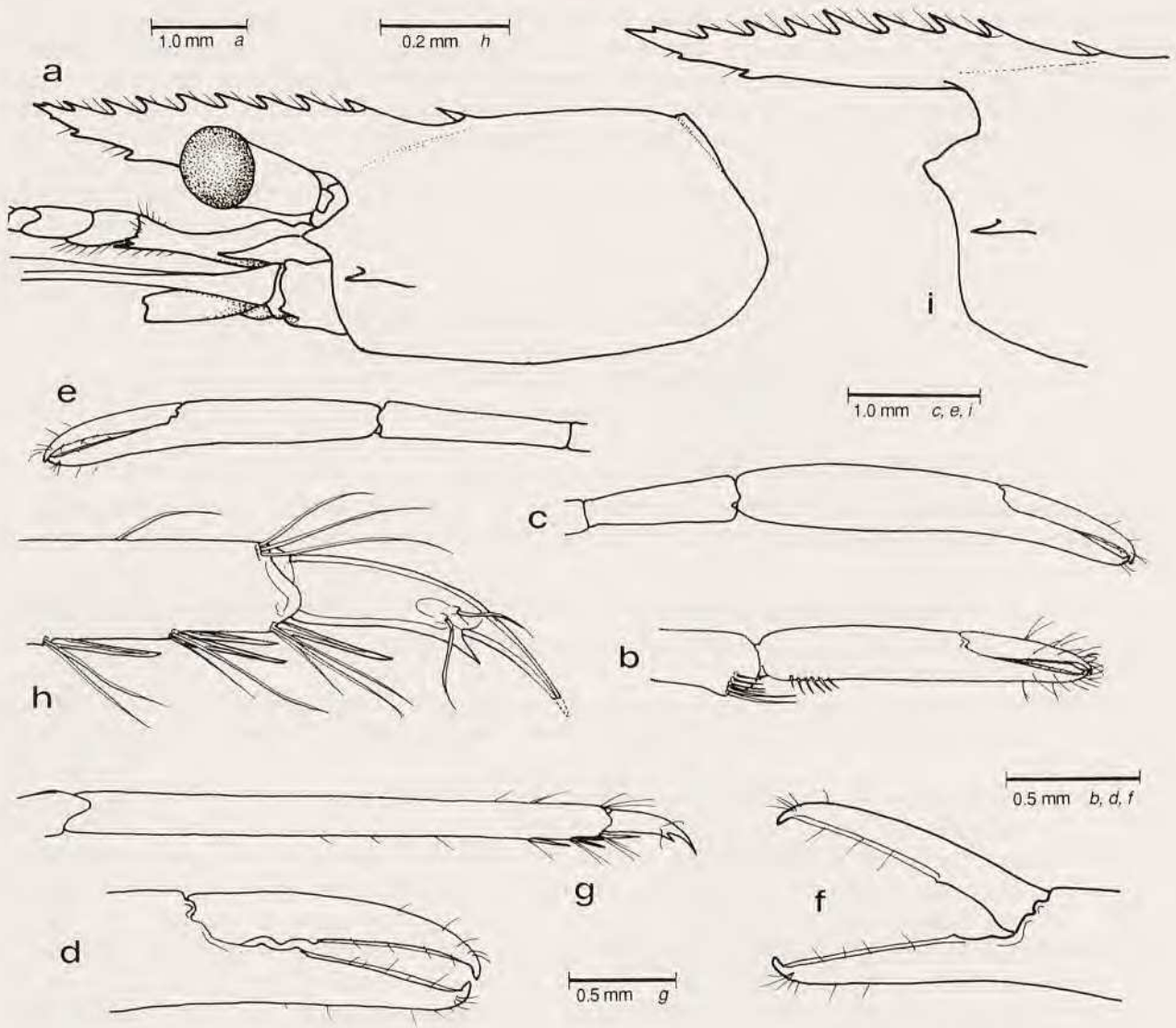

FIG. 7. — *Mesopontonia brucei* Burukovsky, ovigerous ♀, holotype (ZI 1/84264) : **a**, carapace, rostrum and antennal peduncles; **b**, first pereiopod, chela; **c**, major second pereiopod, carpus and chela; **d**, same, fingers; **e**, minor second pereiopod, carpus and chela; **f**, same, fingers; **g**, third pereiopod, propod and dactyl; **h**, same, distal propod and dactyl.

Idem, ♂ (CL 3.0 mm), paratype (ZI 1/84264) : **i**, anterior carapace and rostrum, lateral.

Mesopontonia verrucimanus sp. nov.

Figs 8, 29 c

MATERIAL EXAMINED. — **Indonesia**. KARUBAR : stn DW 50, Tanimbar Islands, 7°59'S, 133°02'E, 184-186 m, 29 October 1991 : 1 ovig. ♀, holotype (MNHN-Na 12850).

DESCRIPTION. — A small-sized pontoniine shrimp of slender, subcylindrical body shape, closely resembling other species of the genus, such as *Mesopontonia gorgoniophila* Bruce.

Rostrum well developed, horizontal, compressed, extending anteriorly to middle of distal segment of antennular peduncle, about 0.66 of carapace length, dorsal carina well developed, posteriorly elevated, dorsal margin convex, with nine evenly distributed acute teeth, first tooth articulated, situated behind posterior orbital margin, distal tooth minute, lateral carinae obsolete, ventral carina feebly developed, margin convex, non-setose. Carapace smooth, glabrous, with epigastric spine at 0.3 of carapace length, supraorbital spines absent, inferior orbital angle acutely produced in lateral view, antennal spine absent, hepatic spine well developed, slender, acute, extending beyond anterior margin of carapace, at about 0.1 of carapace length, well below level of inferior orbital angle, anterolateral angle of branchiostegite bluntly rounded. Abdomen and caudal fan without special features, as in *M. gorgoniophila*.

Antennae as in *M. gorgoniophila*; proximal segment of antennular peduncle with acute ventromedial tooth; statocyst with granular statolith. Eye with well developed globular, pigmented cornea, diameter about 0.17 of carapace length.

Mouthparts mainly undissected. Third maxilliped without exopod, more slender than in *M. gorgoniophila*, ischiomerus and basis fused, no arthrobranch observed, possibly lost in dissection.

First pereiopod more slender than in *M. gorgoniophila*, chela with finger about 0.45 of palm length, carpus about 1.3 times chela length, subequal to merus, coxa with small ventromedial process.

Second pereiopods well developed, markedly unequal, dissimilar. Major pereiopod with chela about 0.65 of carapace length, palm subcylindrical, 3.7 times longer than deep, covered with uniformly distributed small blunt tubercles, many with short simple setae distally, fingers about 0.5 of palm length, dactylus slender, about 3.4 times longer than proximal depth, tapering distally, with acute hooked tip, cutting edge with distal half sharp, with two low acute recurved teeth centrally, proximally blunt, without dorsolateral flange, fixed finger similar, with two teeth opposing dactylar teeth; carpus short, stout, unarmed, about 0.4 of palm length, tuberculate, about 2.2 times longer than distal width, merus about 0.9 of palm length, 6.2 times longer than wide, uniform, smooth, unarmed; ischium about 1.1 times merus length, subequal to palm length, 6.5 times longer than distal width, tapering proximally, smooth, unarmed; basis and coxa without special features. Minor pereiopod with chela about 0.5 of carapace length, 0.75 of major chela palm length, palm subcylindrical, smooth, about 3.0 times longer than distal width, slightly tapering proximally, fingers about 0.7 of palm length slender, with small hooked tips, cutting edges distally sharp, entire, with minute acute tooth proximally; carpus slender, about 0.8 of chela length, 6.0 times longer than distal width, smooth, unarmed; merus about 1.1 times carpus length, 7.0 times longer than distal width, subuniform, unarmed; basis and coxa without special features.

Ambulatory pereiopods slender. Third pereiopod with propod about 0.55 of carapace length, 8.5 times longer than wide, uniform, with a single small slender distoventral spine, three smaller similar spines along ventral border, size decreasing proximally, with transverse row of long setae distolaterally and medially; dactyl about 0.27 of propod length, slender, simple, curved, with clearly demarcated unguis, about 6.0 times longer than proximal width, 0.68 of corpus length, corpus 2.6 times longer than proximal depth, compressed, without distal accessory tooth.

MEASUREMENTS (mm). — Carapace length, 3.6; carapace and rostrum, 6.2; total body length (approx.), 20.0; second pereiopod, major chela, 3.0; minor chela, 1.8.

SYSTEMATIC POSITION. — The present species appears to hold a rather isolated position in the genus *Mesopontonia* and is immediately distinguished from all other species by the presence of tuberculations on the palm of the major second pereiopod, which is smooth in all species previously described, in which the ventral border of the rostrum is also provided with some acute teeth. The only other species of the genus with a simple dactyl on the ambulatory pereiopods is *M. monodactylus* Bruce, 1991. In this species the dactylus is comparatively short and stout, about 0.13 of the propod length, 3.0 times longer than proximal depth, with the propod 11.0 times longer than wide, with stronger distoventral spines. On the chela of the major second pereiopod the dactylus bears a distinct dorsolateral flange and the cutting edge bears only a single acute tooth, larger than in *M. verrucimanus*.

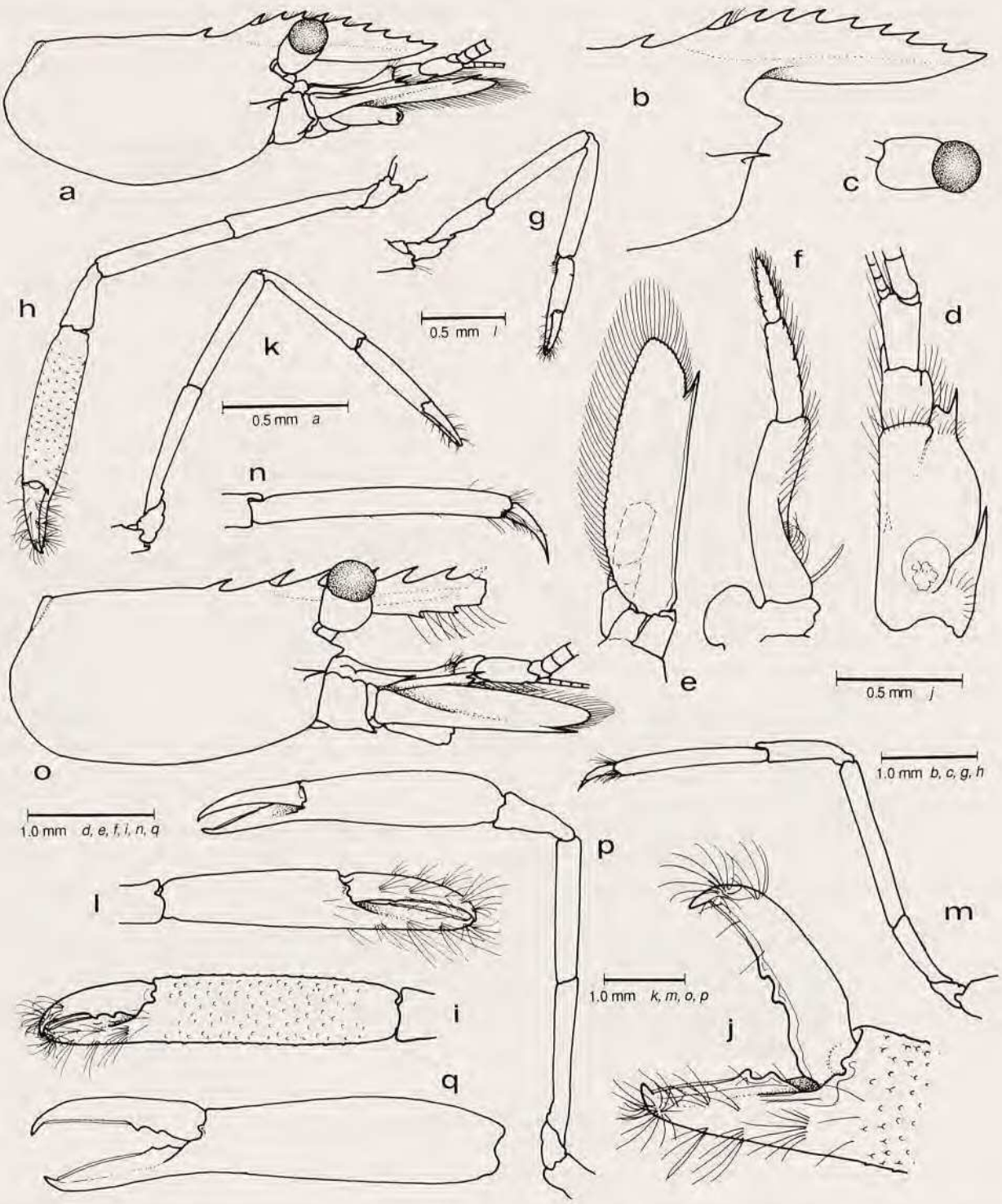

FIG. 8 a-n. — *Mesopontonia verrucimanus* sp. nov., ovigerous ♀, holotype (MNHN-Na 12850) : **a**, anterior carapace, rostrum, eye, antennae; **b**, anterior carapace, rostrum; **c**, eye, dorsal; **d**, antennule; **e**, antenna; **f**, third maxilliped; **g**, first pereiopod; **h**, major second pereiopod; **i**, same, chela; **j**, same, fingers; **k**, minor second pereiopod; **l**, same, chela; **m**, third pereiopod; **n**, same, propod, dactyl.

FIG. 8 o-q. — *Mesopontonia* sp., ovigerous ♀ (MNHN-Na 12849) : **o**, carapace, rostrum, eye, antennae; **p**, second pereiopod; **q**, same, chela.

ETYMOLOGY. — From *verruca* (latin), a wart; *manus* (latin), a hand, with reference to the tuberculate palm of the second pereiopod chela.

Mesopontonia sp.

Figs 8 o-q, 28 b

MATERIAL EXAMINED. — **Indonesia**. KARUBAR : stn CP 86, Tanimbar Islands, 9°26'S, 131°13'E, 225-223 m, 4 November 1991 : 1 ovig. ♀ (MNHN-Na 12849).

REMARKS. — The single examplar, carapace length 3.4 mm, is damaged and incomplete but appears to represent an undescribed species, as it can be distinguished from all the currently known species. The species is not designated as new on account of its incomplete state.

M. monodactylus Bruce and *M. verrucimanus* sp. nov. are immediately excluded from consideration as the dactyl of the third pereiopod of the present specimen is distinctly biunguiculate. The first pereiopod of this specimen also has the fingers of the chela subequal to the length of the palm, in contrast to *M. gracilicarpus* Bruce, 1990, in which the fingers are distinctly shorter than the palm. The single second pereiopod is considered to be the major pereiopod on account of its size and relatively short carpus. As the carpus is distinctly less than half the palm length, the specimen can not be referred to *M. brucei* Burukovsky, 1991, in which it is greater than 0.5 of the palm length. The dactyl lacks a dorsolateral flange and is greater than half the palm length, in contrast to *M. gorgoniophila*, in which the major pereiopod dactyl bears a lateral flange and is considerably less than half the length of the palm.

The taxa referable to *Mesopontonia* may be conveniently separated by the following key :

1. Dactyls of ambulatory pereiopods simple **2**
— Dactyls of ambulatory pereiopods biunguiculate **3**

2. Palm of major second pereiopod tuberculate; R. 1 + 9/0 ..... *M. verrucimanus* sp. nov.
— Palm of major second pereiopod smooth; R. 1 + 8-9/1-2 ..... *M. monodactylus* Bruce

3. Second pereiopods markedly unequal; carpus of minor second pereiopod about 1.5 times length of chela; R. 1 + 8/2 ..... *M. gracilicarpus* Bruce
— Second pereiopods at most moderately unequal, carpus of minor second pereiopod shorter than chela **4**

4. Major second pereiopod with dorsolateral dactylar flange, carpus about 0.2 of palm length; R. 1 + 6-9/1-3 ..... *M. gorgoniophila* Bruce
— Major second pereiopod dactyl without dorsolateral flange, carpus greater than 0.2 of palm **5**

5. Carpus of major second pereiopod greater than half palm length; hepatic spine not exceeding anterior margin of carapace; spines of ambulatory propod simple; R. 1 + 8-9/2-3 ..... *M. brucei* Burukovsky
— Carpus of major second pereiopod less than half palm length; hepatic spine reaching to anterior margin of carapace; spines of ambulatory propods distodorsally serrulate; R. 1 + 6 +/ 3 + ? ..... *Mesopontonia* sp.

The specimen referred to *M. gorgoniophila* by BRUCE (1985) may possibly also represent a further distinct taxon, related to but distinct from that species. The palm of the major chela is very sparsely tuberculate, with the carpus about 0.65 of the palm length, 1.4 times the minor second pereiopod, distinctly different from the situation in *M. gorgoniophila*. The specimen, from 130-137 m only, in the Philippines, lacked most of the rostrum and the hepatic spine reaches to the anterior margin of the carapace. The first pereiopod has the proportions of the segments similar to *M. gorgoniophila* with the carpus short, but still longer, not shorter than the chela, as in the latter species.

DISTRIBUTION. — Type locality : 33°16'S, 43°53'E, 415-460 m. Known only from the type material from the south-west Indian Ocean, south of Madagascar.

Genus *ONYCOCARIS* Nobili, 1904

Onycocaris aualitica (Nobili, 1904)

Figs 1 g-j, 28 c-e

Coralliocaris (Onycocaris) aualitica Nobili, 1904 : 233; 1906 : 60-61, pl. 3 fig. 3.
Onycocaris aualitica - KEMP, 1922 : 278. — HOLTHUIS, 1952 : 14, 147. — BRUCE, 1973 : 962-968, figs 1-3; 1983a : 165.

MATERIAL EXAMINED. — **Indian Ocean**. Isles Glorieuses, intertidal zone, September 1958, coll. A. CROSNIER : 1 ovig. ♀ (MNHN-Na 12871).

REMARKS. — The single examplar, which has only the minor second pereiopod preserved, closely resembles the redescribed type material (BRUCE, 1973), preserved in the Paris Muséum (MNHN-Na 1900).

The rostrum is short and distinctly upturned, and differs from the lectotype female in the presence of a most minutely bifid tip. The inferior orbital angle is produced, broadly acute, and the anterolateral angle of the branchiostegite is also produced. The eyes are subquadrate in dorsal view. The scaphocerite is short, slightly exceeding the carpocerite only, with a small acute distolateral tooth that does not exceed the lamella. The first pereiopods are very slender, and the fingers of the chela are about 0.36 of the palm length. The second pereiopod has a strong distoventral tooth on the ischium and the distoventral angle of the merus has small blunt tooth laterally. The chela has the fingers moderately excavate medially, with stout acute tips. The fixed finger has a small unarmed flange distolaterally, in the lectotype female this is feebly bidentate distally. The cutting edge is distally entire, with a small low acute tooth more proximally, with a series of 4-5 very feeble teeth between it and the first of two larger acute teeth, separated by a distinct notch. The dactyl lacks the low denticles and has only a single acute tooth opposing the two proximal teeth of the fixed finger. The third pereiopod has a short compressed dactyl, with a clearly demarcated unguis bearing three stout acute ventral denticles. The corpus has a strongly compressed trapezoidal distal accessory tooth with a feebly dentate ventral margin and the ventral border bears four stout acute erect denticles. The ventral margin of the propod bears four stout spines and a single larger medial distoventral spine is present.

The mouthparts have been dissected on one side. The small mandible has a well developed acute incisor process with the cutting edge armed with about 40 minute acute denticles. The molar process is slender, obliquely truncate distally with short acute spinules peripherally around the distal margin.

Onycocaris aualitica appears closely related to *O. amakusensis* Fujino & Miyake, 1969, and *O. oligodentata* Fujino & Miyake, 1969. BRUCE (1973) considered that *O. oligodentata* might be synonymous with NOBILI's species. These three species are now each considered to be valid species, although all are closely related. The mandible of *O. aualitica* differs from that of *O. oligodentata* in the presence of about 40 minute denticles in contrast to about 12 larger denticles in that species. In addition, the unguis of the ambulatory dactyl is distinctly denticulate, whereas these denticulations are obsolescent in *O. oligodentata*. The mandible of *O. aualitica* closely resembles that of *O. amakusensis*, but the number of marginal denticles is higher, only 22-23 being present in *O. amakusensis*. The eyes in *O. amakusensis*, as illustrated in MIYAKE & FUJINO (1969, fig. 5a, as *O. quadratophthalma*), appear to be much more quadrate, with a relatively smaller cornea.

DISTRIBUTION. — Type locality : Djibouti. Otherwise reported only from Réunion (BRUCE, 1983a).

Genus *PALAEMONELLA*

Palaemonella rotumana (Borradaile, 1898)

Periclimenes rotumanus Borradaile, 1898 : 383.
Palaemonella rotumana - BRUCE, 1970b : 276-279, pl. 1e-f; 1991a : 229-232, figs 5, 6a-e.

MATERIAL EXAMINED. — **Philippines**. MUSORSTOM 3 : stn DR 117, 12°31'N, 120°39'E, 92-97 m, 3 June 1985 : 3 spms (1 ovig. ♀, 1 bopyridized) (MNHN-Na 12886).

Loyalty Islands. MUSORSTOM 6 : stn DW 431, 20°22.25'S, 166°10.0'E, 21 m, 18 February 1989, coll. B. RICHER DE FORGES : 1 ♂ (MNHN-Na 12885).

REMARKS. — Numerous specimens have been previously reported from New Caledonian waters (BRUCE, 1991) but not actually from the Loyalty Islands. The specimen has a carapace length of 2.65 mm, and presents no special features. The species has been recorded to a depth of 128 m in the South China Sea (BRUCE, 1970).

DISTRIBUTION. — Type locality : Rotuma Island, Fijian Islands. Common and widespread throughout the Indo-West Pacific region, from the Red Sea to Moçambique, east to the Hawaiian Islands, and in the eastern Mediterranean Sea.

Genus ***PARAPONTONIA*** Bruce, 1968

Parapontonia nudirostris Bruce, 1968

Parapontonia nudirostris Bruce, 1968 : 1149-1157, figs 1-5.

MATERIAL EXAMINED. — **New Caledonia**. North 5 miles Channel, SCUBA diving, 20-30 m, 6 November 1989 : 1 ovig. ♀ (MNHN-Na 12875).

REMARKS. — The single example has a carapace length of 4.5 mm, and agrees closely with the description of the holotype specimen, which was first reported from Tiaré Bay, Nouméa. The species is known to be an associate of the crinoid *Tropiometra afra* but the host of the present specimen was not recorded.

DISTRIBUTION. — Type locality : Tiaré Bay, Nouméa, New Caledonia. Otherwise known only from the Australian Great Barrier Reef, to 10 m.

Genus ***PERICLIMENAEUS*** Borradaile, 1915

Periclimenaeus arabicus (Calman, 1939)

Figs 1 k, 28 d-e

Periclimenes (Periclimenaeus) arabicus Calman, 1939 : 210-211, fig. 4.
Periclimenaeus arabicus - HOLTHUIS, 1952 : 130. — BRUCE, 1974 : 1563-1568, figs 3g-f, 4-6, 7c-h; 1980 : 25-27, fig. 11.

MATERIAL EXAMINED. — **New Caledonia**. Maitre Islet Channel, SCUBA diving, 20 m, June 1992, coll. P. BOUCHET : 1 ♂ (MNHN-Na 12883).

REMARKS. — The single example unfortunately lacks the major second pereiopod. It has a carapace length of 2.6 mm, and differs markedly from the type material of this species in the presence of a rather short rostrum, with a dentition of only 3/1. With only a single example, it is difficult to decide if this represents merely an isolated abnormal variation or is representative of a distinct species. In itself, the rostrum appears to be normally developed. However, the type specimen of CALMAN's species has a dentition of 6/0. NOBILI's specimens from Djibouti had rostral dentitions of 9/1 and 8/1 (BRUCE, 1974). In the present specimen the rostrum extends anteriorly to middle of the distal segment of the antennular peduncle. The three dorsal teeth are very acute, the first well in advance of the posterior orbital margin, separated from the second by a larger gap than between second and third teeth but distinctly smaller than that between the third tooth and the acute up-turned tip; the ventral border is convex with a single small slender acute distal tooth. A small supraorbital tubercle is present, and a small acute

antennal spine. In all other respects, the specimen shows the closest resemblance to *P. arabicus*. This is particularly noticeable in the detail of the ambulatory dactyl, often a useful character in distinguishing closely related *Periclimenaeus* species. The dorsal telson spines are well developed, situated at about 0.1 and 0.5 of the telson length, with the posterior pair distinctly smaller than the anterior pair.

Periclimenaeus arabicus has been previously reported from Maitre Islet, Nouméa (BRUCE, 1980) in association with a sponge host *Toxochaelena* sp., also from 20 m; the rostra of all seven specimens with a dentition of 6/1.

DISTRIBUTION. — Type locality : Oman, 19°22.6'N, 57°53.0'E, 13.5 m. Also reported from Djibouti; Kenya, Zanzibar; Tanzania; Maldive Islands; Vietnam; Hong Kong; Japan; Australia; New Caledonia and the Fijian Islands.

Periclimenaeus colodactylus sp. nov.

Figs 9-10

MATERIAL EXAMINED. — **New Caledonia**. Lagoon, Uatio Islet, SCUBA diving, 20-25 m, 10 March 1987, coll. C. MONNIOT : 1 ♂, holotype (MNHN-Na 12926); 1 ovig. ♀, allotype (MNHN-Na 12927); 1 ovig. ♀, 1 ♂, paratypes (NTM Cr 10888); 2 ♂, paratypes (MNHN-Na 12928).

DESCRIPTION. — Small to median sized pontoniine shrimps, general body form subcylindrical, ovigerous females with cephalothorax moderately compressed.

Rostrum short, straight, horizontal, acute, slender, reaching to about distal end of intermediate segment of antennular peduncle, with three dorsal teeth (except for one male with two only), first tooth stout, well in advance of posterior orbital margin, at about 0.3 of rostral length, second and third teeth more acute, compressed, subequally spaced, interspaces setose, lateral carinae obsolete, ventral margin unarmed, convex, non-setose. Carapace smooth, glabrous, without supraorbital spines or tubercles, with distinct postorbital "shoulders", inferior orbital angle small, obtuse, antennal spine large, acute, marginal, branchiostegite with anteroventral angle rounded or slightly produced.

Abdomen with first segment without dorsal lobe, sixth segment about as long as wide, posterolateral angles small, subacute, posteroventral angles large, acute. Telson about 1.75 times sixth segment length, 1.9 times longer than anterior width, lateral margins anteriorly convex, posteriorly straight, convergent, dorsal spines small, acute, about 0.8 of telson length, at about 0.25, 0.5 of telson length, posterior margin broadly rounded, without median process, about 0.4 of anterior width, lateral spines small, stout, blunt, subequal to dorsal spine length, intermediate spines about 0.23 of telson length, slender, very acute distally, submedian spines about 0.8 of intermediate spine length, slender, setulose proximally, tip slender, acute, glabrous.

Antennule with proximal segment without ventromedial tooth, lateral margin angular, distally concave, with small distolateral lobe with small acute lateral tooth, statocyst normal with granular statolith, stylocerite acute, reaching to about 0.5 of proximal segment length; intermediate and distal segments together about 0.6 of proximal segment length; upper flagellum biramous, with five proximal segments fused, robust, short ramus with single segment, longer ramus with seven segments, with about nine groups of aesthetascs.

Antenna with basicerite stout, unarmed, without dorsal lobe, carpocerite about 5.0 times longer than wide, well exceeding distal margin of scaphocerite; scaphocerite about 2.4 times longer than wide, greatest width distally, lateral margin straight, with small acute distolateral tooth, not exceeding anterior margin of lamella.

Eye with small globular, well pigmented cornea, without accessory pigment spot, about 0.8 of stalk width; stalk about 1.2 times longer than wide.

Mouthparts not examined.

First pereiopod robust, not elongate; chela with palm about 1.5 times longer than deep, slightly compressed, broadened distally, fingers stout, subequal to palm length, broad, subspatulate with rounded tips, cutting edges entire; carpus about 1.3 times chela length, about 4.4 times longer than distal width, tapering proximally; merus robust, subequal to carpus length, slightly bowed, 5.0 times longer than central width; ischium, basis and coxa normal, without special features.

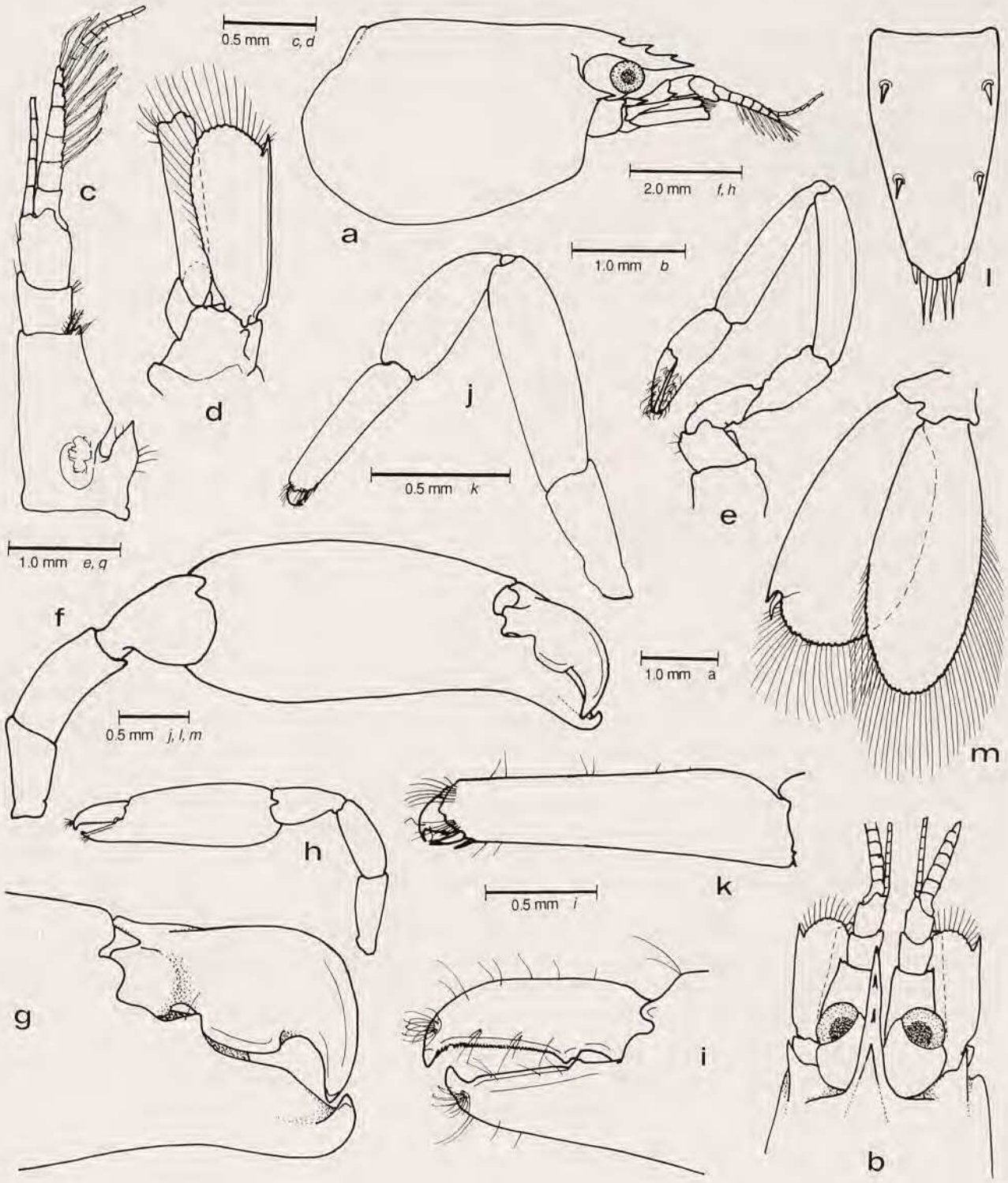

FIG. 9. — *Periclimenaeus colodactylus* sp. nov., ♂, holotype (MNHN-Na 12926), New Caledonia, 20-25 m : **a**, carapace, rostrum, eye and antennal peduncles; **b**, anterior carapace, rostrum, eye, antennal peduncles, dorsal; **c**, antennule; **d**, antenna; **e**, first pereiopod; **f**, major second pereiopod; **g**, same, fingers; **h**, minor second pereiopod; **i**, same, fingers; **j**, third pereiopod; **k**, same, propod and dactyl; **l**, telson; **m**, uropod.

Second pereiopods well developed, grossly unequal, dissimilar. Major chela of male about 2.75 times carapace length, palm smooth, glabrous, about 2.0 times longer than deep, greatest width proximally; dactyl about 0.45 of palm length, curved, distally compressed, about 2.0 times longer than central width, dorsal margin strongly convex, with stout acute hooked tip, cutting edge with large molar process proximally, distally concave, stout, entire; fixed finger about 1.4 times longer than proximal depth, exceeding dactyl, with stout, acute, curved, hooked tip, cutting edge with large fossa proximally, distal cutting edge stout, entire, with small acute proximal tooth medially, larger tooth ventrally; carpus short, stout, about 0.4 of palm length, about 1.3 times longer than proximal width, distally expanded, excavate, unarmed, smooth; merus about 0.4 of palm length, 2.3 times longer than central width, uniform, smooth, unarmed, slightly bowed; ischium about 0.9 of merus length, 2.2 times longer than distal width; basis and coxa stout, without special features. Minor second pereiopod with chela about 0.5 of major chela length, palm tapering distally, feebly compressed, 2.4 times longer than deep, smooth, glabrous, without long ventral setae; dactyl about 2.8 times longer than proximal depth, compressed, straight, dorsal margin convex, with stout hooked tip distally, extending well beyond tip of fixed finger, cutting edge with low acute tooth proximally, largely straight, slightly concave distally, with *ca.* 50 small acute teeth, decreasing to very small size proximally, sparsely setose; fixed finger about 1.7 times longer than proximal depth, with large acute hooked tip distally, cutting edge with small acute tooth proximally, distally cannulate, with medial lip sharp, serrated cutting edge of dactyl closing into groove; carpus about 0.5 of palm length, 2.0 times longer than distal width, unarmed; merus about 1.1 times carpus length, 2.4 times longer than central width, smooth, unarmed, ischium subequal to meral length, 2.8 times longer than distal width; basis and coxa normal. Second pereiopods of ovigerous female, similar to male but smaller.

Ambulatory pereiopods robust. Third pereiopod with dactyl very short, about 0.15 of propod length; unguis distinctly demarcated, stout, strongly curved, about subequal to dorsal length of corpus, 2.0 times longer than basal width, corpus strongly compressed, subcircular, about as long as deep, dorsal and ventral border convex, ventral border sharp, with small acute anteroverted tooth proximally, without distal accessory tooth, with short sensory setate distolaterally; propod 4.0 times longer than proximal width, tapering distally, not markedly inflated, with pair of very large stout distoventral spines, with single smaller spine immediately proximally, rest of ventral border unarmed, distoventral spines reaching of tip of flexed dactyl; carpus about 0.9 of propod length, inflated, compressed, 2.5 times longer than central depth, unarmed; merus about 1.5 times carpal length, 3.3 times longer than wide, unarmed; basis subequal to carpal length, 2.5 times longer than distal width, unarmed; basis and coxa without special features. Fourth and fifth pereiopod similar, more slender.

Male first pleopod with endopod about 4.0 times longer than wide, feebly tapering, rounded distally, medial margin with numerous slender spiniform setae, progressing to plumose setae distally, lateral margin with sparser longer plumose setae. Male second pleopod with endopod bearing appendices at about 0.4 of length, corpus of appendix masculina very short, stout, almost fully fused with endopod, with two very long serrulate terminal spines, two similar shorter ventral spines, reaching to about 0.9 of endopod length; appendix interna normal, greatly exceeding corpus of appendix masculina, with sparse cincinnuli distomedially.

Uropods with protopodite posterolaterally rounded; exopod broad, about 2.0 times longer than wide, lateral margin simple, convex, with strong distoventral tooth, with larger, angulated spine medially; endopod slightly longer than exopod, 2.6 times longer than wide.

MEASUREMENTS (mm). — Male, holotype : carapace length, 2.8; carapace and rostrum, 3.1; total body length (approx.), 11.5; major chela, 8.5; minor chela, 4.0. Ovigerous female allotype, carapace length, 3.2; carapace and rostrum, 4.4; total body length (approx.), 11.0; major chela, 5.8; minor chela, 3.9; length of ovum, 0.5.

HOST. — *Diplosoma versicolor* F. Monniot, 1994 (Ascidiacea : Didemnidae).

ETYMOLOGY. — From *kolos* (Greek), short; *dactylus* (Greek), finger.

SYSTEMATIC POSITION. — *Periclimenaeus colodactylus* sp. nov. is most closely related to *P. nobilii* Bruce, 1974, also an associate of didemnid ascidians. The major feature that distinguishes *P. colodactylus* from *P. nobilii* is the dactyl of the ambulatory pereiopods, which in the former is very short, almost of subcircular shape, with

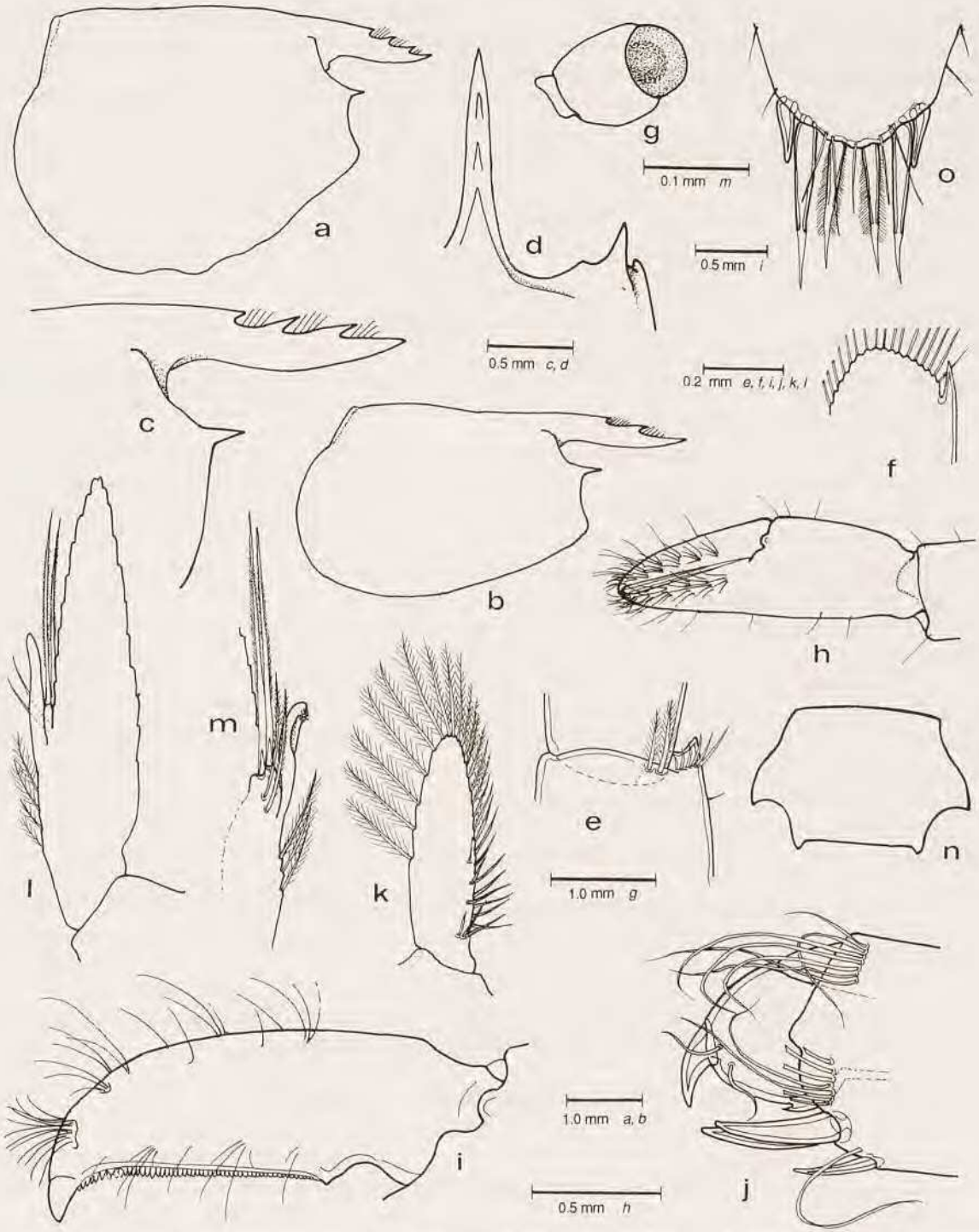

FIG. 10. — *Periclimenaeus colodactylus* sp. nov. : **a**, carapace and rostrum; **b**, same; **c**, anterior carapace and rostrum; **d**, rostrum and right orbital region, dorsal; **e**, antennule, distal end of proximal segment; **f**, scaphocerite, distal; **g**, eye, dorsal; **h**, first pereiopod, chela; **i**, minor second pereiopod, dactyl; **j**, third pereiopod, dactyl and distal propod; **k**, first pleopod, endopod; **l**, second pleopod, endopod; **m**, same, appendices masculina and interna; **n**, sixth abdominal segment, dorsal; **o**, telson, posterior spines.

a, ovigerous female allotype (MNHN-Na 12927); b, male paratype (MNHN-Na 12928); c-o, male holotype. (MNHN-Na 12926).

a small anteroverted proximal accessory tooth ventrally. In *P. nobilii* the dactyl is more elongate, with the ventral margin concave, with a larger proximal tooth, perpendicular to the margin and not anteroverted. The unguis is more slender, less curved. The pair of distoventral propodal spines in *P. nobilii* are much less robust and do not oppose the tip of the unguis on flexion. The minor second pereiopod of *P. nobilii* bears numerous long simple setae and the cutting edge of the dactyl is sinuous, with about 25 teeth only. These setae are absent in *P. colodactylus* and the cutting edge of the dactyl is sublinear, with about 50 smaller teeth.

Periclimenaeus storchi Bruce, 1989

Figs 14 a-c, 29 d

Periclimenaeus storchi Bruce, 1989 : 181-183, fig. 5.

MATERIAL EXAMINED. — **Indonesia**. Chuuk Atoll Research Laboratory, 13 miles west of Murex Resort, west of Manado Town, Manado Island, Sulawesi, 10 m, 9 May 1993, coll. C. MONNIOT : 1 ♀ (bopyridized) (MNHN-Na 12896).

REMARKS. — The single example is almost complete, but the carapace, eyes and antennal peduncles are detached from the thorax. The specimen has a rostral dentition of 3/0, as in the type material but with the tip of the rostrum extending to only slightly beyond the anterior margin of the cornea. The carapace length is about 3.0 mm, and a membranous anterior branchiostegal lobe is discernible. The minor chela is about 0.45 of the major chela length, with the palm smooth, about 2.45 times longer than deep, devoid of ventral setae. The dactyl has an almost straight or feebly convex cutting edge with about 12 distinct acute teeth distally, with the proximal cutting edge obscurely dentate or damaged; the most distal tooth is also damaged, but appears not to have been significantly larger than the adjacent tooth. The fixed finger is deeply cannulate, with stout acute tip distally and numerous long setae medially and laterally. The third pereiopod has the propod about 1.2 times the carpus length, instead of the carpus 1.1 times the propod length in the type material, with the dactyl about 0.3 of the propod length, as in contrast to 0.18 in the holotype of *P. nobilii*. The dactyl has a distinctly demarcated unguis, and is about 2.6 times longer than the basal width, in contrast to about 2.0 in *P. nobilii*, in which the unguis is relatively smaller. The distal propod is provided with three distoventral spines in the present specimen, in contrast to two spines present in the type material and in *P. nobilii*. *Periclimenaeus storchi* is also very closely related to *P. tridentatus* (Miers) as well as *P. nobilii* Bruce, 1974. Specimens of the latter from New Caledonia, associated with *Lissoclinum* and *Diplosoma* hosts, may possibly represent two separate species (BRUCE, 1992). The Siboga Expedition specimens referred to *P. tridentatus* by HOLTHUIS (1952) include *P. hecate* (Nobili) and *P. nobilii* Bruce and some closely related species.The recently described *P. wolffi* is also closely related and these together appear to represent a species complex in association with their didemnid hosts.

HOST. — *Didemnum molle* (Herdman, 1886) [Ascidiacea : Didemnidae]. The association of this species of *Periclimenaeus* with compound ascidian hosts has not been previously established.

DISTRIBUTION. — Type locality : Cuaming Island, Philippines. No other records.

Periclimenaeus stylirostris Bruce, 1969

Periclimenaeus stylirostris Bruce, 1969 : 167-168; 1972 : 68-75, figs 2-6. — BRUCE & COOMBES, 1995 : 122, fig. 8-9. *Periclimenaeus* sp. - LOWRY & SPRINGTHORPE, 1990 : 129.

MATERIAL EXAMINED. — **Chesterfield Islands**. CORAIL 2 : stn DW 46, 19°18.54'S, 158°20.0'E, 21 m, 23 July 1988, coll. B. RICHER DE FORGES : 1 ♂ (MNHN-Na 12877).

REMARKS. — The single example has both second pereiopods, with a rostral dentition of 7/0 and a carapace length of 2.7 mm. The second pereiopod chelae are markedly different in size, with the major chela length 5.4 mm,

twice carapace length and the minor chela 1.75 mm, 0.32 of the major chela length and 0.7 of the carapace length. The third pereiopod dactyl is short, with a well developed distal accessory tooth and an entire ventral border on the corpus. The propod bears a large medial and small lateral distoventral spine, with three small spines along the ventral border. No host was recorded for this specimen, presumably from a sponge.

DISTRIBUTION. — Type locality : South China Sea, 20°N, 113°29.75'E, 89-91 m. Also now known from Fiji; Northern Territory, Australia, and the Coral Sea. Not previously recorded from New Caledonian waters.

Genus ***PERICLIMENELLA*** Duris & Bruce, 1994

Periclimenella spinifera (De Man, 1902)

Periclimenes petitthouarsi var. *spinifera* De Man, 1902 : 824.
Periclimenes (Ancylocaris) spiniferus - KEMP, 1922 : 195-196.
Periclimenes (Harpilius) spiniferus - HOLTHUIS, 1952 : 76-78, fig. 30.
Periclimenes spiniferus - BRUCE, 1976 : 95, figs 5-6.
Periclimenella spinifera - DURIS & BRUCE, 1995, 656-661, fig. 19-20.

MATERIAL EXAMINED. — **New Caledonia**. Senez Reef, SCUBA diving, 7 m, 7 September 1992, coll. P. BOUCHET : 1 ovig. ♀ (MNHN-Na 12868).

REMARKS. — As one of the commonest and most widely distributed of Indo-West Pacific pontiniine shrimps, it is surprising that this specimen is the first record of its ocurrence in New Caledonian waters. The specimen has carapace length of 3.3 mm, but lacks the rostrum. The supraorbital spines are distinct and the major chela is preserved, so that there is no doubt about its identity.

DISTRIBUTION. — Type locality : Ternate, Ambon, Indonesia. Widely reported, generally as *Periclimenes spiniferus*, throughout most of the Indo-West Pacific region, except Red Sea, Persian Gulf and northwest Indian Ocean, east to Tahiti.

Genus ***PERICLIMENES*** Costa, 1844

Periclimenes albatrossae Chace & Bruce, 1993

Fig. 11 a

Periclimenes albatrossae Chace & Bruce, 1993 : 100-101, fig. 20.

MATERIAL EXAMINED. — **Indonesia**. KARUBAR : stn CP 75, Tanimbar Islands, 8°46'S, 131°36'E, 452-451 m, 3 November 1991 : 1 ovig. ♀ (MNHN-Na 12867).

REMARKS. — The single example agrees closely with the description of the holotype, the only previously known specimen, except for some minor variations considered as of less than specific importance.

The rostrum has a dentition of nine dorsal and four ventral teeth as in the holotype, but the ventral teeth appear rather larger and more acute. The rostrum is about 0.95 of the carapace length and slightly more slender. The rostrum is only slightly less, about 0.90, in the holotype, and in both far exceeds the antennular peduncle. The epigastric, hepatic and antennal spines are similar.

Only the right second pereiopod is preserved. The chela is slender and equals 0.8 of the carapace length, with the dentition of the fingers less well developed than illustrated for the holotype, and may represent the minor chela of the pair.

The ambulatory pereiopods clearly show the characteristic and unique dactyl distinguishing this species from all others of the genus. The slender curved unguis is distinctly demarcated from the strongly compressed corpus, which bears a sharp, distally produced ventral carina, with a minute inferior tooth. The ventral corpus is entire and bears

sparse short feeble submarginal setae. The propod also bears a minute distoventral spinule, with two similar ventral spinules. These are difficult to discern and may well have been overlooked in the description of the holotype, in which they were not noted.

The telson also differs slightly from that of the holotype specimen, which was provided with seven pairs of small laterally placed, marginal dorsal spines. In the present specimen six spines are present on the left and five on the right. The number of dorsal telson spines in *P. albatrossae* can therefore be 6-7 pairs and possibly only 5 pairs.

The catch records for station CP 75 indicate that a variety of echinoderms were obtained, including specimens of echinoids of the family Echinothuriidae. In view of the similarity of *P. albatrossae* to *P. hertwigi* discussed below, it seems probable that these echinothuroids were the host animals of this specimen.

SYSTEMATIC POSITION. — *Periclimenes albatrossae* occupies an obscure position in relation to the other species of the genus *Periclimenes*, particularly on account of the increased number of dorsal telson spines, typically only two pairs of which are present in almost all pontoniine (and palaemonoid) shrimps. The systematic value of this character is discussed in detail below, but more than two pairs of spines may also be present in other genera, such as *Plesiopontonia* Bruce, a possible associate of bivalve hosts (BRUCE, 1985).

The ambulatory dactyl is possibly of more systematic value and strongly suggests a relationship with *P. hertwigi* Balss, *P. dentidactylus* Bruce and *P. calcaratus* Chace & Bruce. These species are probably all associated with echinothurid hosts, although this is proved only for *P. hertwigi.* These species show a reduction in rostral length and dentition, with increased ornamentation of the distoventral angle of the ventral ambulatory dactylar carina, with additional ornamentation also at the base of the unguis and increasing robustness and anterior shift in position of the hepatic spine. These features are most marked in *P. calcaratus* and least developed in *P. dentidactylus*, which appears to be the species most closely related to *P. albatrossae*.

DISTRIBUTION. — Type locality : South China Sea, west of Luzon, Philippines, 16°33.52'N, 119°52.54'E, 315 m. There have been no further records of this species, which was collected in 1909. The present record, in addition to the extension of the known range of this species, also provides a significant increase in its bathymetric range and the interval between the dates of capture of the two specimens may suggest a genuine rarity.

Periclimenes alcocki Kemp, 1922

Fig. 11 b-d

Palaemon (Brachycarpus) laccadivensis Alcock, 1901 : 138 (partim).
Periclimenes (Periclimenes) alcocki Kemp, 1922 : 154-156, figs 21-24.
Periclimenes alcocki - BRUCE, 1991b : 302-308, figs 2-5.

MATERIAL EXAMINED. — **Indonesia**. KARUBAR : stn CP 83, Tanimbar Islands, 9°23'S, 131°00'E, 285-297 m, 4 November 1991 : 88 spms (MNHN-Na 12837-12840); 1 ♂, 1 ovig. ♀ (NTM Cr 010887).

REMARKS. — The present specimens agree closely with the redescription of this species provided by BRUCE (1991) and enable this description to be further expanded. The collection of 90 specimens from a single catch represents the first occasion on which a small population of a deep-water pontoniine shrimp has become available for study and for the amount of intraspecific variation to be analysed.

The 90 specimens from stn CP 83 consist of 21 males (28%), 69 females (76.6%), of which 65 (94.2%) were ovigerous. No specimens were infected by bopyrid parasites.

In the males, the carapace length ranged from 8.5-11.2 mm, in the ovigerous females, from 9.5-16.2 mm. The smallest female had a carapace length of 7.4 mm. The mean carapace length for the males was 10.1 mm, and for the ovigerous females, 11.4 mm.

In the 21 male specimens, the rostral dentition varies from 1 + 8/2 to 1 + 11/4. Seventeen specimens (80.9%) have a rostral dentition of 1 + 8-10/ 2-3. Of the 64 ovigerous females, with intact rostra, the rostral dentition varies from 1 + 7/2 to 1 + 11/4, with 55 specimens (85.9%) having a rostral dentition of 1 + 8-10/2-3. In all specimens the rostrum extended well beyond the antennular peduncle and appeared comparatively slender, without an up-turned tip.

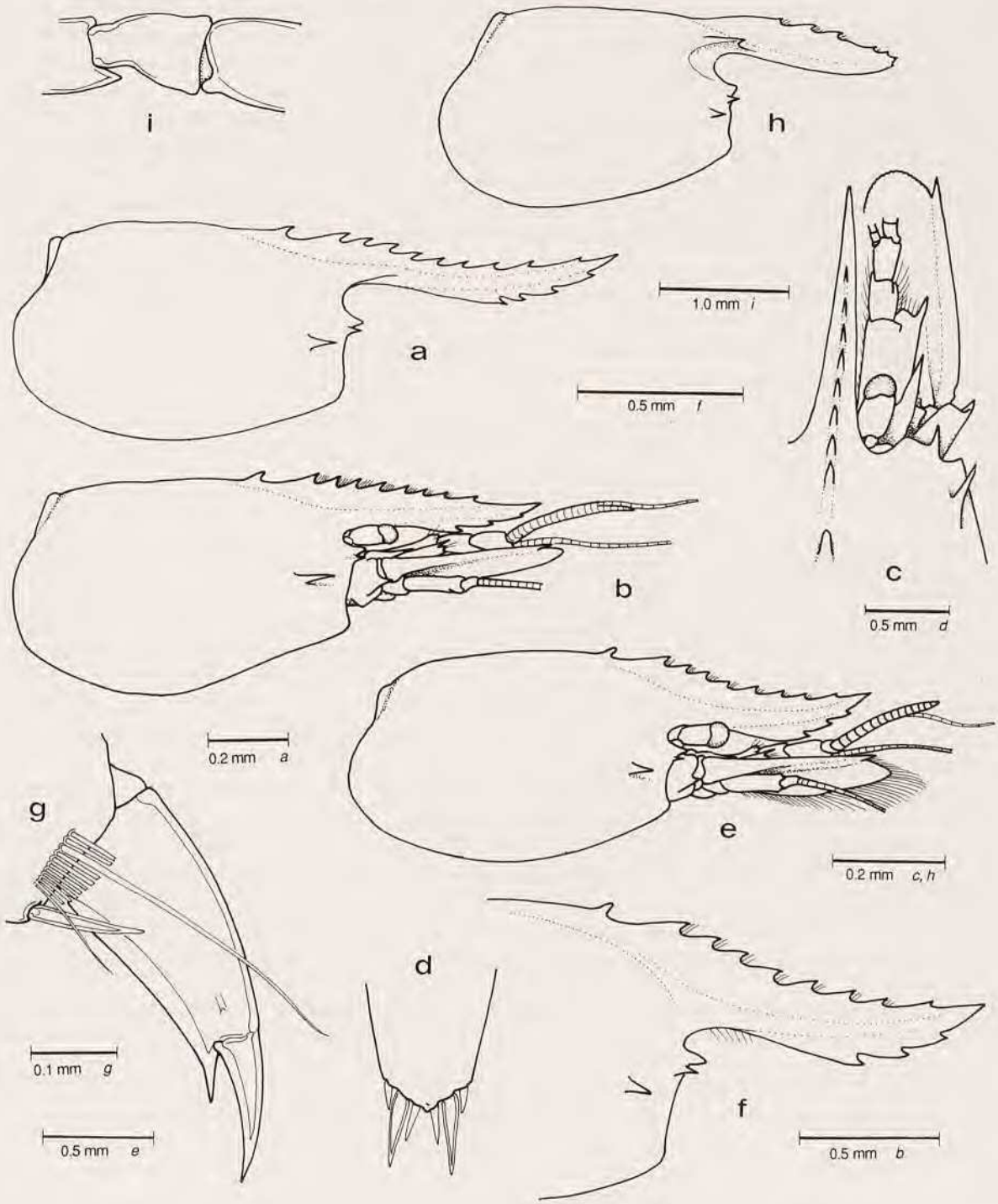

FIG. 11 a. — *Periclimenes albatrossae* Chace & Bruce, ovigerous ♀ (MNHN-Na 12867): carapace and rostrum.

FIG. 11 b-d. — *Periclimenes alcocki* (Kemp), ovigerous ♀ (MNHN) : **b**, carapace, rostrum, eye, antennae; **c**, right anterior carapace, rostrum, eye, antennal peduncles; **d**, posterior telson spines.

FIG. 11 e-g. — *Periclimenes* cf. *alcocki,* ovigerous ♀ (MNHN-Na 12841) : **e**, carapace, rostrum, eye, antennae; **f**, anterior carapace, rostrum; **g**, fifth pereiopod, distal propod and dactyl.

FIG. 11 h-i. — *Periclimenes amboinensis* (de Man), ovigerous ♀ (MNHN-Na 12876) : **h**, carapace, rostrum; **i**, second pereiopod, carpo-meral and carpo-propodal articulations.

In the males, ten specimens had the major chela on the right, nine on the left. The major chela varied from 1.76 to 2.04 times the carapace length, with a mean of 1.87 (N=10). The minor chela varied from 1.09 to 1.58 times the carapace length, with a mean of 1.39 (N=17). The major chela varied from 1.18 to 1.41 times the minor chela length, with a mean of 1.32 (N=8).

In the females, 31 specimens had the major chela on the right, 25 on the left. The major chela varied from 1.03 to 1.7 times the carapace length, with a mean of 1.50 (N=49). The chela was greater than 1.3 times the carapace length in 86% of the specimens. The minor chela varied from 0.75 to 1.57 of the carapace length, with a mean of 1.16 (N=34). The minor chela is greater than the carapace length in 92% of the specimens. The major chela varied from 1.14 to 1.59 of the minor chela length, with a mean of 1.31 (N=40).

The ambulatory pereiopods are as previously described (BRUCE, 1991). The dactyl has a clearly demarkated unguis, a relatively small acute accessory tooth, and the propod bears a few short spines distoventrally, with transverse rows of short setae.

The distribution and number of dorsal telson spines shows considerable variation. The major variations are illustrated in the following table :

No. of spines	2:2	2:3	2:4	3:3	3:4	4:4	4:5
♂ N = 20	3	4	0	5	2	4	2
♀ N = 68	5	7	1	22	15	18	0
♂ ♀ N = 88	8	11	1	27	17	23	2

Of the 20 males only 12 (60%) had a symmetrical distribution of the dorsal telson spines, with 2, 3 or 4 pairs, with 3 pairs being the most frequent combination. Of the 68 females with undamaged telsons, only 45 (66%) had a symmetrical spine distribution, again with 2, 3 or 4 pairs, also with 3 pairs as the commonest combination. Of the available specimens, only 23 (26%) have the four pairs of dorsal telson spines as described for the type material of this species, and 8 (9%) appear to have the usual two pairs found in the vast majority of *Periclimenes* species, as also in most other pontoniine shrimps.

In all specimens, of both sexes, the chela was densely covered with small tuberculations, extending on to the proximal parts of both the dactyl and the fixed finger. The dactylar flange is always well developed and the swollen appearance of the fixed finger is invariably distinct in all adult specimens. The overall picture of this species is of a high degree of morphological consistancy with relatively little variation other than in the number of dorsal telson spines. This character, to which a considerable amount of diagnostic weight has been given, is thus one of the less reliable features in the identification of this species.

The specimens agree closely with the specimen described from the Loyalty Islands by BRUCE (1991), although the tuberculation of the second pereiopods appears more marked, but differ slightly from some of the other specimens referred to *P. alcocki* (BRUCE, 1978; KUBO, 1940; HAYASHI, 1986). Detailed analysis is hindered by lack of information concerning the holotype specimen in the collections of the Indian Museum, Calcutta.

HOST. — The specimens were found in association with large quantities of *Virgularia* sp. (Pennatulacea : Virgulariidae).

DISTRIBUTION. — Type locality : Laccadive Sea, 90°34'57"N, 70°36'30"E, 930 m. Also reported from Madagascar (?); Sala y Gomez; New South Wales, Australia; Japan (?); Philippines, and New Caledonia.

Periclimenes aff. *alcocki* Kemp 1922

Fig. 11 e-g

MATERIAL EXAMINED. — **Indonesia**. KARUBAR : stn CP 38, Tanimbar Islands, 7°40'S, 132°27'E, 620-666 m, 28 October 1991 : 1 ♂, 1 ♀ (MNHN-Na 12841).

REMARKS. — The two specimens show the closest resemblance to *P. alcocki* Kemp, as recorded above, with which they were collected, and previously described (BRUCE, 1991b), but differ from this material and also the female holotype specimen figured by KEMP (1992, fig. 21) in the presence of a deeper rostral lamina, with a strong

upward curve distally. The rostrum is precisely similar in the male and female specimens and contrasts strongly with straight, slender, feebly up-curved rostrum consistently found in all the specimens referred to *P. alcocki* from stn CP 83 above. In addition to all other major morphological features, the dactyl of the ambulatory pereiopods appears precisely similar to that of *P. alcocki*, as figured in BRUCE (1991b, fig. 5i), other than that the accessory tooth is distinctly longer and more slender and acute. The numerous minor variations shown by the various specimens of widely scattered origins that have been referred to *P. alcocki*, and the high morphological consistency of the 90 specimens from stn CP 83 - (other than the dorsal telson spines), suggest that a complex of closely related species may be concealed by the species name, possibly each associated with different deep-water host animals. Lack of detailed knowledge of the holotype, particularly of its ambulatory pereiopods, is a significant impediment to the resolution of this complex situation.

Periclimenes amboinensis (de Man, 1888)

Figs 11 h-i, 28 f

Anchistus amboinensis de Man, 1888 : 546-548, pl. 22a fig. 2.
Periclimenes amboinensis - BORRADAILE, 1898 : 385. — BRUCE, 1983b : 874-876, figs 1-3, 7b; 1991a : 235.

MATERIAL EXAMINED. — **New Caledonia**. North 5 Miles Channel, 20-30 m, dredge, 6 November 1989 : 1 ovig. ♀ (MNHN-Na 12876).

REMARKS. — The single example is in good condition, with a carapace length of 4.4 mm. The rostrum differs from previously described specimens and has a dentition of 5/1, with a strongly convex non-setose ventral border with a single minute preterminal ventral tooth. The dorsal series of teeth is slightly irregular and suggests that six teeth "should" have been present. The rostrum reaches to the end of the intermediate segment of the antennular peduncle. The species has been previously reported from New Caledonian waters, at Améré Reef, at a depth of 6 m (BRUCE, 1991a), when the female specimen had a rostral dentition of 6/1, the male having 7/1. In these specimens, and the male and ovigerous female from Ambon illustrated by BRUCE (1983b, fig. 1 A-B) the ventral rostral margin is less markedly convex and bears a small acute tooth at about 0.75 of its length. The present specimens have the second pereiopods subequal and precisely similar, with the chelae about 1.33 of the carapace length. Both chelae have a conspicuous stout acute distal ventrolateral tooth on the merus. The ambulatory dactyl of the third pereiopod closely resembles that of the specimen illustrated by BRUCE (1983b, fig. 7b), although the length of the unguis relative to the corpus appears slightly shorter, the accessory tooth is similarly distinct. The propod bears a single small distoventral spine, with a single ventral spine only. The distoventral end of the propod also bears oblique rows of short, broad setae, both medially and laterally, somewhat shorter in the present specimen than in the one figured by BRUCE (1983b), which project only a short distance beyond the ventral border of the dactylar corpus, presenting an appearance that may have caused DE MAN, in his description of the no-longer extant holotype, to describe the dactyl as "ein wenig behaart". The telson, as in the previous New Caledonian specimens, is provided with two pairs of small laterally placed dorsal spines, at about 0.5 and 0.72 of the telson length, and is not devoid of dorsal spines as reported in CHACE & BRUCE (1993). In the original description, DE MAN states that the telson of *P. amboinensis* is without dorsal spines, indicating, at least, that none were discerned. This cannot now be ascertained, but is most likely to be due to an individual abnormality. The number and distribution of dorsal telson spines can show considerable variations (see *P. alcocki* above). At present no species of *Periclimenes* are known that normally has less than two pairs of dorsal spines although these may be very small in some species. The eyes have the cornea rather distorted but the terminal papilla appears to have been only short.

The unusual rostrum cannot be fully evaluated on the basis of a single specimen, especially one from an unknown host, and may indicate the existence of a further species with a rostral dentition of 6/0-1, with the ventral margin distinctly convex and lacking a tooth at 0.75 of its length, a less markedly conoidal cornea, and with reduced setation and spinulation of the ambulatory pereiopods.

DISTRIBUTION. — Type locality : Ambon, Indonesia. Also reported from the Maldive Islands; Cartier Reef, Timor Sea; Great Barrier Reef; Améré Reef, New Caledonia, and the Marshall Islands.

Periclimenes commensalis Borradaile, 1915

Fig. 12 a-g

Periclimenes (Cristiger) commensalis Borradaile, 1915 : 24; 1917 : 364.
Periclimenes (Periclimenes) commensalis - KEMP, 1922 : 166. — HOLTHUIS, 1952 : 53-56, figs 18-19. — MONOD, 1976 : 145-147, figs 45-51.

MATERIAL EXAMINED. — **Loyalty Islands**. Ouvéa, Mouli, 9-11 m, SCUBA diving, 13 November 1991, coll. J.-L. MENOU : 1 ovig. ♀ (MNHN-Na 12880).

REMARKS. — The single example is well preserved, with both the short, robust second pereiopods carried extended directly anteriorly. It has a carapace length of 2.2 mm, with a rostral dentition of 5/2. It corresponds closely to previous descriptions, except that the cornea appears more ogival and less hemispherical than usually reported. The distolateral angle of the proximal segment of the antennular peduncle is deeply bidentate. The chelae of the second pereiopods are subequal and similar, only slightly exceeding the carapace length. The fingers are feebly dentate proximally and minutely serrate distally, about subequal to the palm length. The proximal region of the palm shows a shallow annular construction, so that the proximal end is subspherical, forming a ball-and-socket joint with the distally excavate carpus. The distolateral angle of the carpus bears a small blunt tooth. The dactyl of the third ambulatory pereiopod is as illustrated by HOLTHUIS (1952), biunguiculate, with a strong additional distodorsal spine on the corpus. The distoventral propodal spines are well developed, with small distal dorsal denticles. The species has been previously reported from New Caledonia by MONOD (1976), but not from the Loyalty Islands.

DISTRIBUTION. — Type locality : Murray Island, Torres Strait, Australia. Also reported from Kenya; Zanzibar; Moçambique; Indonesia; Hong Kong; Ryukyu Islands; Philippines; Solomon Islands; Queensland, Australia; Coral Sea; New Caledonia; Fijian Islands and Marshall Islands.

Periclimenes galene Holthuis 1952

Periclimenes (Harpilius) galene Holthuis, 1952 : 62-64, fig. 24.

MATERIAL EXAMINED. — **Comoro Islands**. BENTHEDI : stn 32R, north of Pamanzi Island, Mayotte, 12°45.1'S, 45°17.9'E, outer reef slope, 15-20 m, dredge, 25 March 1977 : 1 ♂, 2 ovig. ♀, 1 juv. (MNHN-Na 12866).

REMARKS. — The specimens are in poor condition with many appendages missing but are readily identified by the characteristic rostrum, first pereiopod chela and ambulatory propods and dactyls. The most intact ovigerous female has a carapace length of 2.5 mm. and the rostral dentition is : ♂, 1 + 5/0; ovig. ♀, 1 + 6/0; juv., 4/0. The species has not been previously reported from the Comoro Islands.

DISTRIBUTION . — Type locality : Ambon, Indonesia. Also known from Menado, Indonesia; Kenya; Zanzibar; and Heron Island, Australia.

Periclimenes hirsutus Bruce, 1971

Periclimenes hirsutus Bruce, 1971 : 91-98, figs 1-6.

MATERIAL EXAMINED. — **New Caledonia**. LAGON : stn DW 1116, 19°37.3'S, 163°52.6'E, 38 m, dredge, 25 October 1989, coll. B. RICHER DE FORGES : 1 ♂, 1 ovig. ♀ (MNHN-Na 12895).

REMARKS. — The two specimens are in close agreement with the original description of material from Fiji and are in good condition, although slightly macerated, lacking only the right second pereiopod in the female

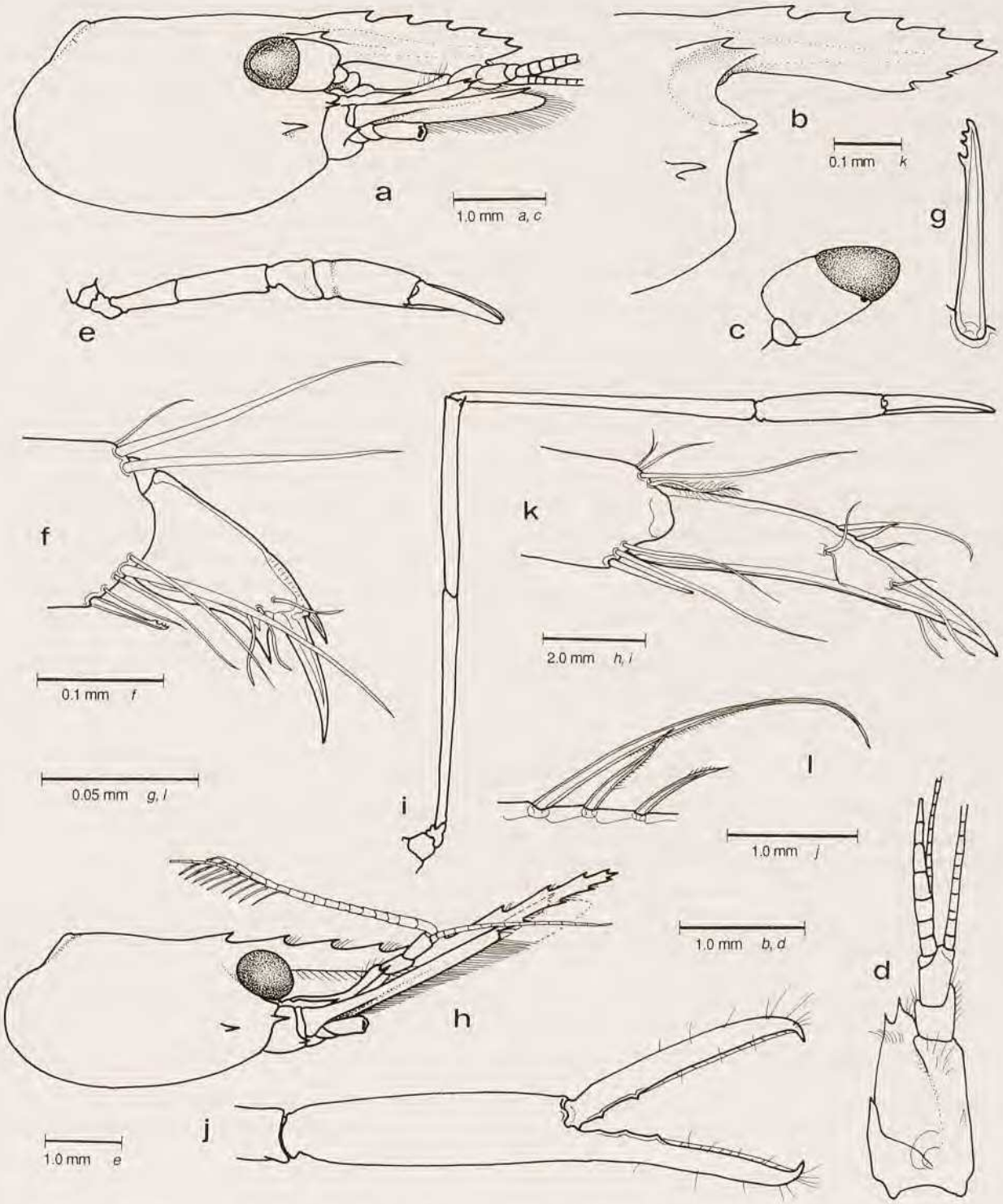

FIG. 12 a-g. — *Periclimenes commensalis* Borradaile, ovigerous ♀ (MNHN-Na 12880) : **a**, carapace, rostrum, eye and antennal peduncles; **b**, anterior carapace and rostrum; **c**, eye, dorsal; **d**, antenna; **e**, second pereiopod; **f**, third pereiopod, distal propod, dactyl; **g**, same, propod, distoventral spine.

FIG. 12 h-l. — *Periclimenes tenuipes* Borradaile, ♂ (MNHN-Na 12865) : **h**, carapace and rostrum, eye, antennal peduncles; **i**, second pereiopod; **j**, same, chela; **k**, third pereiopod, distal propod, dactyl; **l**, same, corpus of dactyl, dorsal setae.

specimen. The male has a carapace length of 4.9 mm and a rostral dentition of 8/0, which in the female are 4.5 mm and 9/2. In both, the fingers of the second pereiopods and the propods of the ambulatory pereiopods retain a reddish colouration. The pubescence of the carapace is quite well marked in the male but much less so in the female, but may have been lost through abrasion. The depth of capture, 38 m, represents a bathymetric record for this species.

DISTRIBUTION. — Type locality : Mukulau, Viti Levu, Fijian Islands. Also known from Zanzibar, and the Seychelles and Andaman Islands. Not previously known from New Caledonia.

Periclimenes imperator Bruce, 1969

Periclimenes imperator Bruce, 1967 : 53-62, figs 23-25; 1968 : 1166-1167, fig. 10; 1991a : 237.

MATERIAL EXAMINED. — **New Caledonia**. *Loc. incert.*, SCUBA diving, 18 m, 20 November 1989 : 1 ovig. ♀ (MNHN-Na 12915). — Maitre Islet, SCUBA diving : 1 ♂, 1 ovig. ♀ (MNHN-Na 12916).

REMARKS. — The first specimen, from uncertain locality, has a carapace length of 6.0 mm and a rostral dentition of 28/0, and was associated with an unidentified synaptid host. Previously New Caledonian specimens have also been found on non-synaptid holothurian hosts, *Holothuria* sp. (BRUCE, 1991a). The Maitre Islet specimens are larger, both with carapace lengths of 8.0 mm, and with rostral dentition of 34/0 and 32/0, but their host was not recorded. All specimens have a minute acute preterminal ventral tooth on the corpus of the dactyl of the third pereiopods, larger in the females and obsolescent in the male. In all specimens the distolateral angle of the proximal segment of the antenular peduncle is distinctly bi- or tridentate. The specimens have no trace of any epigastric tooth, but are otherwise very similar to *P. rex* Kemp.

DISTRIBUTION. — Type locality : Chumbe Island, Zanzibar. Also reported from the Red Sea to Madagascar, north to the Ryukyu Islands and east to Hawaii.

Periclimenes incertus Borradaile, 1915

Periclimenes (Cristiger) incertus Borradaile, 1915 : 210; 1917 : 364, pl. 53 fig. 7.
Periclimenes (Periclimenes) incertus - HOLTHUIS, 1952 : 193-194.
Periclimenes (Harpilius) sp. - MONOD, 1976 : 22, figs 37-41.
Periclimenes incertus - BRUCE, 1980 : 10-13, figs 4f-k, 5a-c.

MATERIAL EXAMINED. — **New Caledonia**. Nouméa, Maitre Islet Channel, 20 m, SCUBA diving, June 1992, coll. P. BOUCHET : 1 ovig. ♀ (MNHN-Na 12881).

REMARKS. — The species has been previously reported from New Caledonia by MONOD (1976), BRUCE (1980) and LEDOYER (1984). The specimen has a carapace length of 2.3 mm and rostral dentition of 1 + 7/1. The ventral rostral carina is obsolete, but the dorsal carina is well developed, more elevated than in *P. obscurus*.

DISTRIBUTION. — Type locality : South Nilandu Atoll, Maldive Islands. Also reported from Aden (Yemen); Kenya; Zanzibar; Tanzania; Madagascar; Andaman Islands; Sri Lanka; Singapore; Indonesia; Australia; Philippines and New Caledonia.

Periclimenes involens sp. nov.

Figs 13, 28 h

MATERIAL EXAMINED. — **Philippines**. MUSORSTOM 3 : stn DR 117, off Mindoro, 12°31'N, 120°39'E, 92-97 m, 3 June 1985 : 1 ♂ paratype, 1 ♀ holotype (MNHN-Na 12847); 2 ♀ paratypes (MNHN-Na 12848).

DESCRIPTION. — In general morphology, closely resembling *Periclimenes richeri* Bruce, 1990, and *P. vaubani* Bruce, 1990, the present specimens are in slightly macerated condition, three specimens with both second pereiopods, and one specimen badly damaged.

Carapace smooth, glabrous, with rostrum well developed, about subequal to carapace length, extending to end of antennular peduncle, shallow, straight, horizontal, dorsal carina distinct, low, not proximally elevated, with rostral dentition of 1 + 6-7/2, dorsal teeth small, acute, uniformly distributed along margin, first tooth situated posterior to orbital margin, second tooth over posterior margin, ventral carina obsolete, margin setose proximally with two small acute teeth distally, lateral carinae feebly developed; supraorbital spines absent, inferior orbital angle produced, acute in lateral view; antennal spine slender, acute, marginal, upturned, exceeding inferior orbital angle; hepatic spine well developed, at lower level than antennal; epigastric tooth small, slender. Abdomen as in *P. richeri* or *P. vaubani*.

Antennule as in *P. vaubani*, but with distolateral tooth of proximal segment reaching to middle of intermediate segment, with medial lobe more angular. Antenna with basicerite with acute lateral tooth; carpocerite not exceeding half of scaphocerite length; scaphocerite well developed, exceeding antennular peduncle, about 3.8 times longer than central width, lateral margin feebly concave, with large distolateral tooth far exceeded by bluntly angulate distal lamella. Eye with cornea globular, well pigmented, with small dorsal accessory pigment spot, wider than stalk, diameter about 0.24 of carapace length.

Mandible with mouthparts as in *P. vaubani*.

First pereiopods slender, palm subcylindrical, feebly compressed, 3.0 times longer than deep, fingers slender, simple, about 0.75 of palm length; carpus about 1.2 times palm length; merus about 1.15 times carpus length; ischium, basis and coxa normal, coxa with small distoventral lobe with long simple setae.

Second pereiopods well developed, unequal. Major chela about 1.65 times carapace length, palm subcylindrical, feebly compressed, smooth, about 4.3 times longer than deep, fingers about 0.3 of palm length, dactyl with feeble distolateral carina, acute tip, entire distal cutting edge, proximal cutting edge with two acute teeth, distal tooth larger; fixed finger similar, without flange, with four teeth on proximal cutting edge, two distal teeth larger, more acute, proximal teeth smaller, rounded, with small fossae for the reception of dactylar teeth; carpus about 0.33 of palm length, distally expanded, unarmed; merus about 0.75 of palm length, about 6.0 times longer than wide, unarmed; ischium about 0.85 of merus length; basis normal; coxa with setose distoventral process. Minor chela about 1.2 times carapace length, 0.75 of major chela length, palm smooth, about 4.5 times longer than deep, fingers about 0.56 of palm length, slender, dactyl with feeble dorsal flange, proximal cutting edge with two small acute denticles, fixed finger similar, without flange, cutting edge with three proximal denticles; carpus about 0.65 of palm length, 3.5 times longer than distal width; merus almost subequal to palm length, 5.7 times longer than distal width, ischium about 0.85 of merus length; basis and coxa as in major limb.

Ambulatory pereiopods slender, similar to *P. vaubani*; third pereiopod with propod length about 0.8 of carapace length, 14 times longer than wide, with pair of distoventral spines, three single spines on distal half of ventral border, with few long simple distal setae; dactyl about 0.16 of propod length, biunguiculate, with well developed, acute accessory tooth, unguis distinctly demarcated, slender, about 0.65 of corpus length, 2.7 times accessory tooth length.

Uropods as in *P. vaubani*.

MEASUREMENTS (mm). — Holotype : carapace length, 3.1; carapace and rostrum, 6.0; total body length, 14.0 (approx.); major second pereiopod, chela, 3.9; minor second pereiopod, chela, 3.5.

SYSTEMATIC POSITION. — *Periclimenes involens* is most closely related to *P. vaubani* Bruce, 1990, and *P. richeri* Bruce, 1990.

P. involens may be distinguished from *P. vaubani* by its lack of a proximally elevated dorsal rostral carina and a less acute rostrum, with a dentition of 0 + 7-8/2, rather than 0 + 8-9/2. The second pereiopods are similar, with a flange on the dactyl of the major second pereiopod as in *P. vaubani*, but the cutting edge bears a single larger, acute, recurved tooth, with two larger teeth only opposing on the fixed finger. The propod of the ambulatory dactyl is more strongly spinose and setose in *P. vaubani* than in *P. involens*.

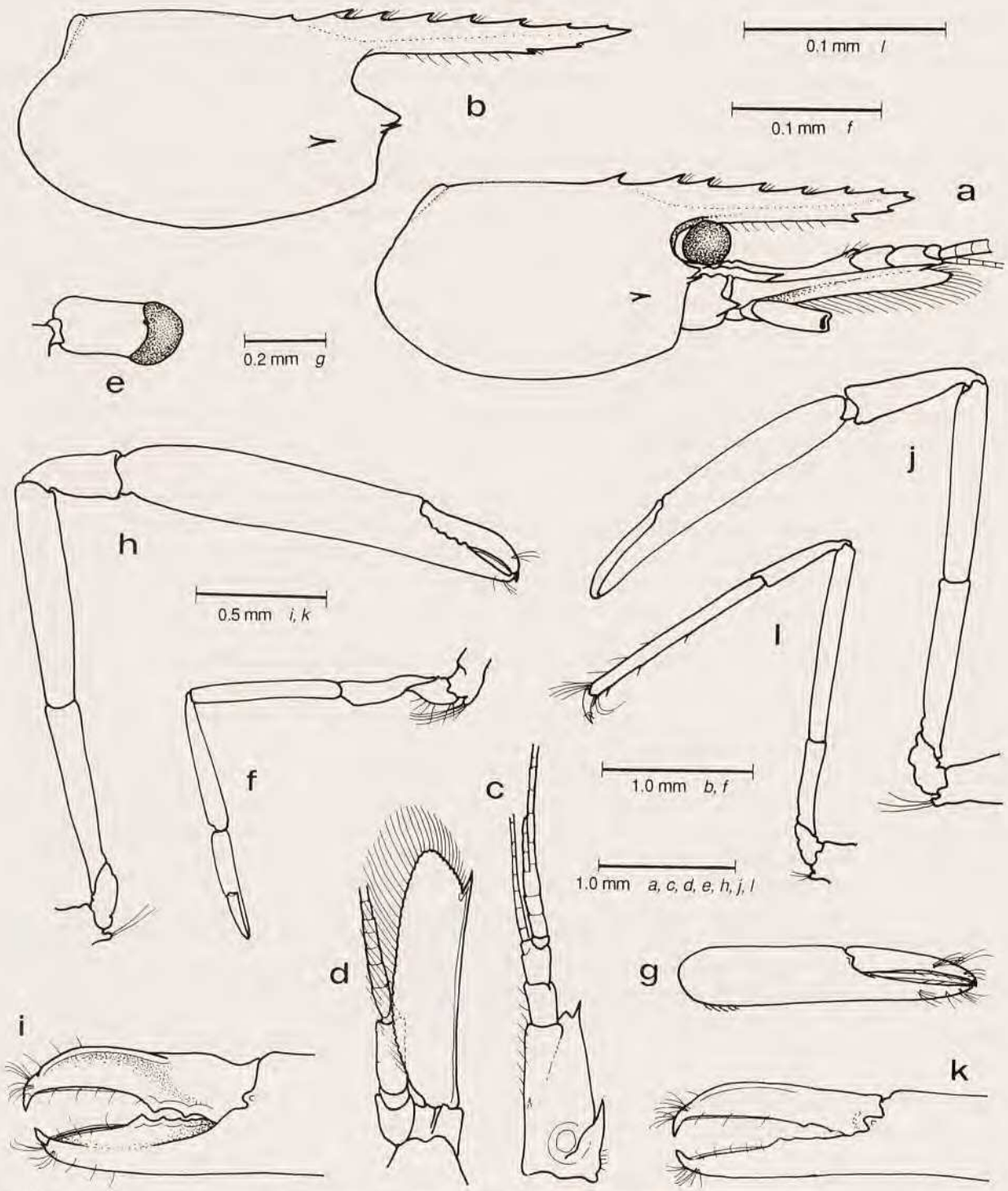

FIG. 13. — *Periclimenes involens* sp. nov., Philippines, 92-97 m : **a**, carapace, rostrum, eye, antennae; **b**, carapace, rostrum; **c**, antennule; **d**, antenna; **e**, eye, dorsal; **f**, first pereiopod; **g**, same, chela; **h**, major second pereiopod; **i**, same, fingers of chela; **j**, minor second pereiopod; **k**, same, fingers of chela; **l**, third pereiopod.

P. involens may be distinguished from *P. richeri* by the more uniform, less tapering, horizontal rostrum, with a straight ventral margin, rather than a depressed rostrum with the ventral margin convex, and the presence of two

well developed acute distal ventral teeth, in contrast to a single small denticle. In *P. richeri*, the corneal diameter is only about 0.14 of the carapace length, but 0.24 in *P. involens*.

The proportions of the minor second pereiopod in *P. involens* suggest that the second pereiopod preserved of *P. richeri* is also the minor appendage, and not the major one as described. In *P. involens* the carpus is about 0.65 of the palm length, 0.9 of the palm length in *P. richeri*.

ETYMOLOGY. — *In*, not (Latin) and *volens* (Latin), wanted. The species was discovered at an inconveniently late stage in the preparation of the report.

REMARKS. — *Periclimenes vaubani* and *P. richeri* are both known only from New Caledonian waters at 445-650 m and 527 m respectively, *P. involens* is therefore found in significantly shallower depths.

Periclimenes magnificus Bruce, 1979

Periclimenes magnificus Bruce, 1979c : 195-207, figs 1-5, pl. 1a-c.

MATERIAL EXAMINED. — **New Caledonia**. West of Isle of Pines, 30 m, SCUBA diving, 13 March 1989, coll. P. LABOUTE : 1 ♂, 1 ♀ (MNHN-Na 12893). — Woodin Canal, 30 m, SCUBA diving, coll. P. LABOUTE : 1 ovig. ♀ (MNHN-Na 12894).

REMARKS. — This species has not been previously recorded from New Caledonian waters. The male specimen has a carapace length of 4.2 mm, rostral dentition of 1 + 6/2, the female, 4.4 mm and 1 + 8/2, with the ovigerous female 4.4 mm and 1 + 8/2. In the Isle of Pines specimens the tips of the fingers are all distinctly reddish. The second pereiopod carpus is also distinctly shorter than the palm length. In the ovigerous female, the fingers each bears a series of four small acute recurved teeth.

DISTRIBUTION. — Type locality : Wistari Reef, Heron Island, Queensland, Australia. Also known from Japan, Indonesia and the Philippines.

Periclimenes nilandensis Borradaile, 1915

Periclimenes (Falciger) nilandensis Borradaile, 1915 : 211; 1917 : 372, pl. 54 fig. 13.
Periclimenes (Harpilius) nilandensis - HOLTHUIS, 1952 : 58-60, fig. 22.
Periclimenes nilandensis - BRUCE, 1978 : 222-227, figs 8-9.

MATERIAL EXAMINED. — **New Caledonia**. SMIB 5 : Anaa Reef (21°22,70'S, 166°01,50'E, 38 m, SCUBA diving, 11 September 1989 : 13 spms (7 ovig. ♀) (MNHN-Na 12842).

REMARKS. — The specimens present no special features. The largest ovigerous female has a carapace length of 3.5 mm and a rostral dentition of 10/5, with the first two teeth situated on the carapace. Where both are present, the second pereiopods are subequal. The fourth thoracic sternite has an acute median process and the ventral abdomen is provided with distinctive black chromatophores, as previously noted in material from Madagascar (BRUCE, 1978). Previously recorded from gorgonian hosts, the host of the present specimens was not recorded.

DISTRIBUTION. — Type locality : South Nilandu Atoll, Maldive Islands. Also known from Kenya; Zanzibar; Madagascar; Indonesia; South China Sea, and Australia, to 133 m. Not previously recorded from New Caledonia.

Periclimenes novaecaledoniae Bruce, 1968

Periclimenes novaecaledoniae Bruce, 1968 : 1157-1165, figs 6-9; 1980 : 8-10, fig. 4a-c; 1991 : 237-238.

MATERIAL EXAMINED. — **New Caledonia**. Maitre Islet, 20 m, SCUBA diving, June 1992, coll. P. BOUCHET : 1 spec. (MNHN-Na 12843).

REMARKS. — First described from material from Nouméa, with several subsequent records from New Caledonia (see synonymy). The single example has a carapace length of 3.1 mm and a rostral dentition of 7/1. Very feeble supraorbital ridges are present, each with a small central eminence. The second pereiopod chelae are subequal and similar, with the distal cutting edges minutely serrated. The second pereiopods of the type material had the chelae unequal.

DISTRIBUTION. — Type locality : Nouméa, New Caledonia. Subsequently reported only possibly from Madagascar (BRUCE, 1977).

Periclimenes obscurus Kemp, 1922

Periclimenes (Periclimenes) obscurus Kemp, 1922 : 144-146, figs 14-15.

MATERIAL EXAMINED. — **New Caledonia**. Maitre Islet, SCUBA diving, 20 m, June 1992, coll. P. BOUCHET : 1 ovig. ♀ (MNHN-Na 12891).

REMARKS. — The species has not been previously reported from New Caledonia. The specimen has a carapace length of 2.3 mm and rostral dentition of 1 + 7/1. The ventral rostral carina is obsolete, but the dorsal carina is well developed, more elevated than in *P. incertus*.

DISTRIBUTION. — Type locality : Springhaven, Madras, India. Also known sparsely from Kuwait; Kenya; Zanzibar; Tanzania; Madagascar; India and Australia.

Periclimenes psamathe (de Man, 1902)

Urocaris psamathe de Man, 1902 : 816-822, pl. 25 fig. 51.
Periclimenes (Ancylocaris) psamathe - KEMP, 1922 : 173.
Periclimenes psamathe - BRUCE, 1970 : 541-543, fig. 3; 1991 : 238, figs 1a, 3a. — MONOD, 1976 : 14-22, figs 1-28.

MATERIAL EXAMINED. — **New Caledonia**. SMIB 5 : Anaa Reef (21°22,70'S, 166°01,50'E, 38 m, SCUBA diving, 11 September 1989 : 1 ovig. ♀ (MNHN-Na 12902).

LAGON : stn DW 1069, 30 m, 19°59.1'S, 163°52.5'E, 23 October 1989, coll. B. RICHER DE FORGES : 1 ♀ (MNHN-Na 12903). — Stn DW 1189, North Lagoon, 19°24.2'S, 163°18.0'E, 53 m, 31 October 1989, coll. B. RICHER DE FORGES : 1 ovig. ♀ (MNHN-Na 12901).

REMARKS. — Previously recorded from New Caledonian waters by BRUCE (1970a, 1991a) and MONOD (1976), to depths of 55 m, reaching to 84 m in the South China Sea (BRUCE, 1979b). The specimens add nothing to previous descriptions. The ovigerous female has a carapace length of 7.0 mm.

DISTRIBUTION. — Type locality : Ternate, Indonesia. Also known from East Africa, Maldive and Chagos Islands; Indonesia; Philippines; Japan; Australia and Caroline Islands.

Periclimenes rectirostris Bruce, 1981

Periclimenes rectirostris Bruce, 1981 : 204-211, figs 12-15; 1991b : 313-314, figs 73-74.

MATERIAL EXAMINED. — **Philippines**. MUSORSTOM 3 : stn CP 107, 14°02'N, 120°28'E, 111-115 m, 2 June 1985 : 1 ovig. ♀ (MNHN-Na 12869).

REMARKS. — The single example is in good condition, with only the right second pereiopod and extreme rostral tip missing, rostral dentition 0 + 12/5, carapace length 13.0 mm. This species was first discovered off Lubang, at 129-134 m.

DISTRIBUTION. — Type locality : off Lubang, Philippines, at 129-134 m. Otherwise reported only from the Chesterfield Islands, New Caledonia, at 315-330 m.

Periclimenes tenuipes Borradaile 1898

Figs 12 h-l

Periclimenes tenuipes Borradaile, 1898 : 384; 1899 : 406, pl. 36 fig. 2. — BRUCE, 1991a : 240.
Periclimenes (Ancylocaris) tenuipes - KEMP, 1922 : 220-224, pl. 8 fig. 1.
Periclimenes (Harpilius) tenuipes - HOLTHUIS, 1952 : 84-85.

MATERIAL EXAMINED. — **Futuna Islands**. MUSORSTOM 7 : stn CP 498, 14°19'S, 178°03'E, 105-160 m, 10 May 1992 : 1 ♂, 1 ovig. ♀ (MNHN-Na 12865).

REMARKS. — This species was reported from New Caledonian waters by BRUCE (1991a) from depths of 8-80 m and from the Philippines at 22 m (CHACE & BRUCE, 1993). Most records have been from shallow depths or from intertidal pools. The present specimens appear to be the first record of this species from a depth over 100 m, the previous maximum depth record having been 80 m.

The male specimen lacks both second pereiopods and has a carapace length of 3.6 mm and a rostral dentition of 0 + 9/7. The abdomen is detached from the cephalothorax. The mandible is without a palp and the molar and incisor processes are particularly robust, but the mouthparts are essentially similar to those of *Periclimenes grandis*, with a subequally bilobed basal endite on the maxilla; distinct basal and coxal endites on the first maxilliped, the latter feebly bilobed, with a large endite, the anterior lobe of which reaches to the distal border of the caridean lobe; third maxilliped with ischiomeral and basal segments distinct, with a small lamellate arthrobranch (BRUCE, 1976). The epipod of the second maxilliped differs in the absence of a podobranch.

The ovigerous female has a carapace length of 3.3 mm and a rostral dentition of 0 + 11/8; and is very similar to the male. The right second pereiopod has the chela about 1.3 times the carapace length, with carpus 1.6 times the meral length, 1.29 times the chela length, with the palm 1.19 times the length of the fingers, all conforming to the parameters provided by KEMP (1922). The fingers of the chela each bear a pair of small teeth proximally, with the distal 0.6 of the cutting edge sharp and entire: the finger tips are strongly hooked and the fingers bear a pre-terminal band of red in the preserved specimens.

The specimens are remarkable mainly for this small size, as they are clearly adults, with a reduced rostral dentition in the male. CHACE and BRUCE (1993) give a general rostral dentition of 11-13/6-9, with the first tooth posterior to the level of the hepatic spine, as occurs in the present specimens. The cornea is well pigmented, equal to about 0.33 of the carapace length, as in shallow water specimens. The propods of the ambulatory pereiopods also show a feeble segmentation, as reported by KEMP (1922) for *P. tenuipes*. Apart from their small size, the only feature noted, not found in *P. tenuipes*, is that the median process on the fourth thoracic sternite is more acute and is distinctly curved anteriorly in both specimens, presenting a rather hook-like appearance, without parallel in any species of the *P. grandis* group, and not present in large, shallow-water specimens of *P. tenuipes*, in which it is quite straight.

DISTRIBUTION. — Type locality : Ralun, New Britain. Also known extensively from the Red Sea, East Africa to the Ryukyu Islands, east to the Marshall Islands.

Periclimenes uniunguiculatus Bruce, 1990

Figs 14 d-f, 29 g

Periclimenes uniunguiculatus Bruce, 1990 : 167-174, figs 12-14.

MATERIAL EXAMINED. — **Comoro Islands**. BENTHEDI : stn DS 48, off Anjouan, 11°54.6'S, 44°56.8'E, 500 m, 28 March 1977 : 1 ovig. ♀ (MNHN-Na 12870).

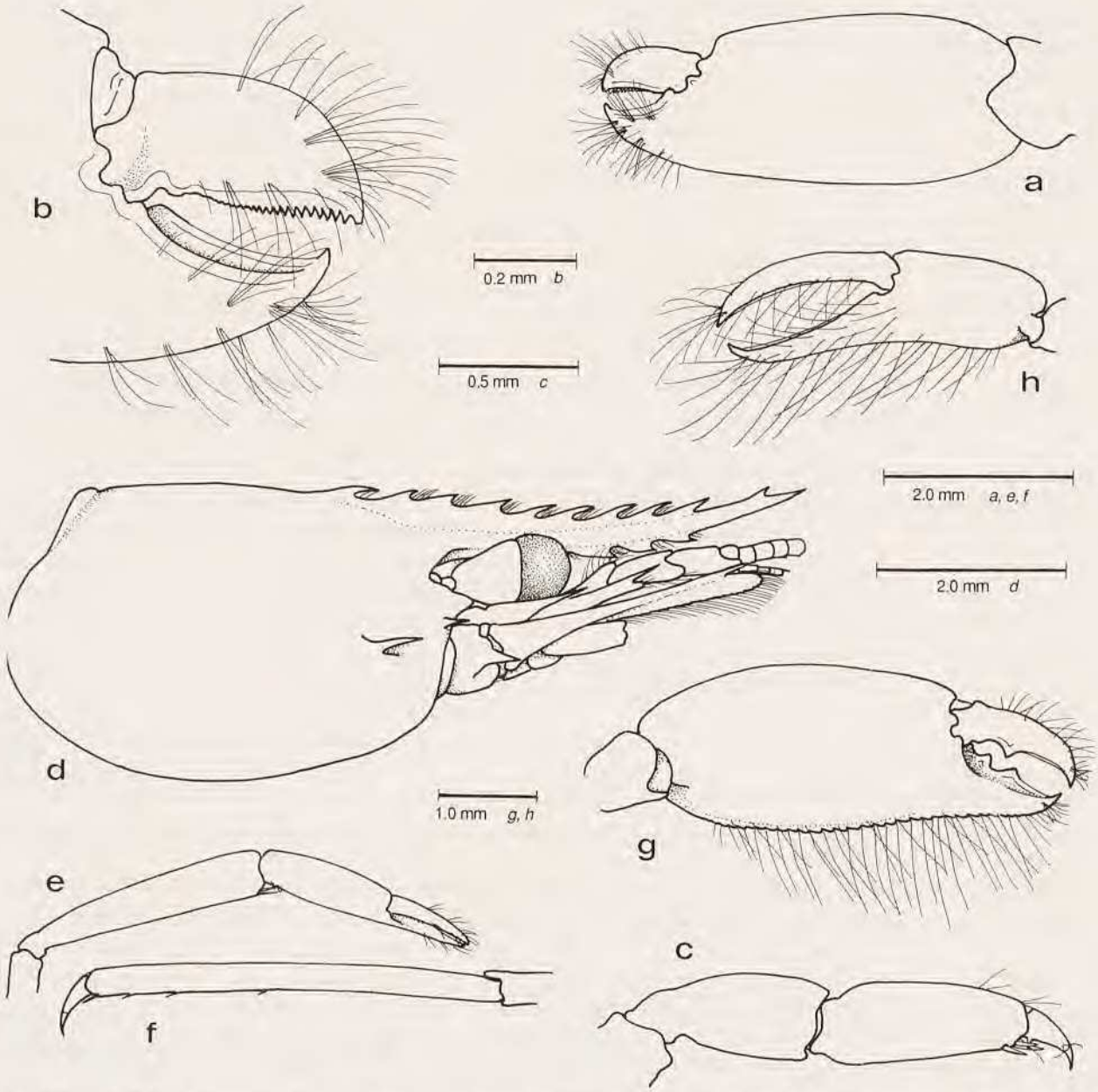

FIG. 14 a-c. — *Periclimeneaeus storchi* Bruce, ♀ (MNHN-Na 12896), Indonesia, Manado Island, 10 m : **a**, minor second pereiopod, chela; **b**, same, fingers; **c**, third pereiopod, carpus, propod, dactyl.

FIG. 14 d-f. — *Periclimenes uniunguiculatus* Bruce, ovigerous ♀ (MNHN-Na 12870), Comoro Islands, 500 m : **d**, carapace and rostrum, eye, antennal peduncles; **e**, first pereiopod, carpus and chela; **f**, third pereiopod, propod, dactyl.

FIG. 14 g-h. — *Pontonia anachoreta* Kemp (Senckenberg Museum), Yemen (Aden) , 46 m : **g**, second pereiopod major chela; **h**, same, minor chela.

REMARKS. — The single example, which lacks second pereiopods, differs slightly from the holotype and only previously known specimen. The range of morphological variation for this species is at present unknown, so the significance of the differences cannot at present be determined but, in view of the wide geographical separation of the two localities of capture, it is not unlikely that two species may be involved. For the moment, however, the present specimen is referred to *P. uniunguiculatus*. Both specimens were captured at similar depths, the holotype specimen from 540-600 m.

The specimen has a carapace length of 3.7 mm and a rostral dentition of 10/2, with the two proximal teeth situated on the carapace, without a clearly demarcated epigastric spine; the rostrum is slender, extending well beyond the antennular peduncle and scaphocerite, and is distinctly up-curved. The central dorsal teeth are noticeably long and slender, much more so than in the holotype. The first pereiopod has the chela much shorter than the carpus, rather than subequal, and the fingers about 0.67 of the palm length, rather than 0.75. The third pereiopod dactyl is similar but the unguis is nearly subequal to the dorsal corpus length and not about 0.66 of this length, and is also more slender. The propod is about six times the dactyl length, instead of eight times, with the small ventral spines spread over the distal half of the ventral border, rather than confined to the distal fourth. The simple ambulatory dactyl is largely obscured by long setae arising from transverse rows on the distal medial and lateral propod as in the holotype.

DISTRIBUTION. — Type locality : New Caledonia, 23°06'S, 167°47'E, 540-640 m.

Genus ***PONTONIA*** Costa, 1844

Pontonia anachoreta Kemp, 1922

Figs 14 g-h, 29 i

Pontonia anachoreta Kemp, 1922 : 264-266, figs 93-95.

MATERIAL EXAMINED. — **Yemen (Aden)**. *"Meteor"*, Cruise 5 : stn 236, 12°19.0'N, 43°27.3'E, 45 m, 6 March 1987 : 1 ♂, 1 ♀ (Senckenberg Museum).

REMARKS. — The specimens agree well with published descriptions. The male has a carapace length of 2.8 mm, the female 2.7 mm. The cornea of the eyes of both specimens has a golden colouration. The second pereiopods have the chelae similar in male and female and both are characteristically provided with numerous long simple setae, not noted as occurring in other species. The dactyl of the ambulatory pereiopods shows numerous differences from the next species, *P. ascidicola*. The corpus of the dactyl is compressed, tapering distally and sparsely setose. The unguis is large, with a feebly bifid tip and without proximal ventral pectinulations. The accessory tooth is acute, recurved and with feeble indications of a bifid tip. The ventral margin bears five slender acute anteroverted teeth, with two more feeble denticles proximally. The propod bears robust ventral spines, a stout distal pair and two single proximal spines.

HOST. — *Polycarpa* sp., aff. *anguinea* (Sluiter, 1897) (Ascidiacea: Styelidae). A new host record.

DISTRIBUTION. — Type locality : off Madras, India. Previously reported from the Gulf of Aden by CALMAN (1939). Otherwise known only from Kenya.

Pontonia ascidicola Borradaile, 1898

Fig. 29 g-h

Pontonia ascidicola Borradaile, 1898 : 389; 1899 : 409, pl. 36 fig. 6. — HOLTHUIS, 1952 : 165-169, figs 79-81.

MATERIAL EXAMINED. — **New Caledonia**. Neokumbi Reef, outer slope, 20-40 m, SCUBA diving, 9 March 1987, coll. C. MONNIOT : 1 ♂, 1 ovig. ♀ (MNHN-Na 12889).

REMARKS. — These small specimens agree well with earlier descriptions. The ovigerous female carries about 16 ova of normal pontoniine size (length *ca.* 0.5 mm).

The dactyls of the ambulatory pereiopods, although with a multidentate ventral margin, differ markedly from these of the previous species, *P. anachoreta*. The dactylus is about 3.1 times longer than deep, with the greatest

depth at about half the length, and the ventral margin distinctly convex. The unguis is clearly demarcated from the corpus and feebly denticulate distally, with the proximal ventral margin minutely pectinulate. The accessory dactyl is recurved, with an indication of being feebly bifid at the tip. The ventral denticles, of which there are about 10-12, are well developed distally but obsolescent proximally, the distal denticles having rounded club-shaped tips. The corpus is generally compressed with numerous setae. The propod is also setose, but without any spinulation.

HOST. — *Ascidia sydneiensis* Stimpson, 1854 (Ascidiacea : Ascidiidae). A new host record.

DISTRIBUTION. — Type locality : Blanche Bay, New Britain, Indonesia. Also reported from Eylath, Israel; and Madagascar. Also known from Binongko, Sulawesi, Indonesia, from a depth of 278 m (HOLTHUIS, 1952). Not previously recorded from New Caledonian waters.

Pontonia compacta sp. nov.

Figs 15-18

MATERIAL EXAMINED. — **New Caledonia**. LAGON : stn 415, 22°36.3'S, 167°14.2'E, 10-60 m, 24 January 1985, coll. B. RICHER DE FORGES : 1 ♂ holotype (MNHN-Na 12851).

DESCRIPTION. — A small sized pontoniine shrimp of subcylindrical, slightly depressed body form. Rostrum well developed, about 0.55 of carapace length, slightly depressed, extending well beyond antennular peduncle and carpocerite, broad, about as long as basal width, with well developed convex lateral carinae, dorsal surface convex, without median carina, tip rounded with minute denticle ventrally, with simple small short simple seta, ventral carina well developed, straight, non-setose. Carapace smooth, glabrous, without epigastric, supraorbital, hepatic or antennal spines; orbit distinct, with posterior expansions of lateral rostral carinae concealing proximal and medial eyestalk, extending to acutely produced inferior orbital angle, with small medial inflection, anterolateral angle slightly produced, rounded.

Abdomen smooth, glabrous, pleura of all segments broadly rounded; sixth segment about 1.6 times length of fifth, posterolateral angle small, blunt, posteroventral angle larger, broadly rounded. Telson about 2.5 times sixth segment length, 2.0 times longer than wide, lateral margins feebly convex, posteriorly convergent, with two pairs of small submarginal dorsal spines, about 0.1 of telson length, at about 0.6 and 0.8 of telson length; posterior margin about 0.3 of anterior width, with three pairs of spines and single simple seta, lateral spines small, about 0.3 of dorsal spine length, intermediate spines about 0.15 of dorsal telson length, 1.5 times dorsal spine length, slender, submedian spines of similar length, more slender, setulose.

Antennule short, stout, robust, peduncle extending well short of rostral tip; proximal segment of peduncle about 1.1 times longer than wide, with large acute anterolateral lobe reaching to about level of distal margin of intermediate segment, with very large acute ventromedial tooth; statocyst normal, with granular statolith, stylocerite robust, broad, distally acute, reaching to about 0.6 of segment length; intermediate and distal segments short, broad, combined length equal to about 0.6 of proximal segment length; upper flagellum biramous, proximal three segments of rami short, stout, fused, shorter free ramus reduced to single segment, with seven groups of aesthetascs, longer ramus slender, with seven segments only; upper ramus carried flexed beneath lateral rostral carina.

Antenna with basicerite short, stout, laterally unarmed; ischiocerite and merocerite normal; carpocerite long, slender, about 4.0 times longer than wide, extending well beyond antennular peduncle, almost to rostral tip; scaphocerite well developed, exceeding antennular peduncle, lamella reaching to about 0.6 of carpocerite length, oval, lamella about 1.5 times longer than wide, maximal width at about 0.7 of length, lateral margin strongly convex, with large curved acute distal tooth extending far beyond anterior margin of lamella.

Eye with cornea small, feebly oblique, well pigmented, without dorsal accessory pigment spot; stalk subcircular, depressed, about 1.25 times wider than long.

Mandible without palp, molar process robust, truncate, with stout teeth and bands of setae distally, incisor process slender, obliquely truncate distally, with seven small acute teeth. Maxillula with short feebly bilobed

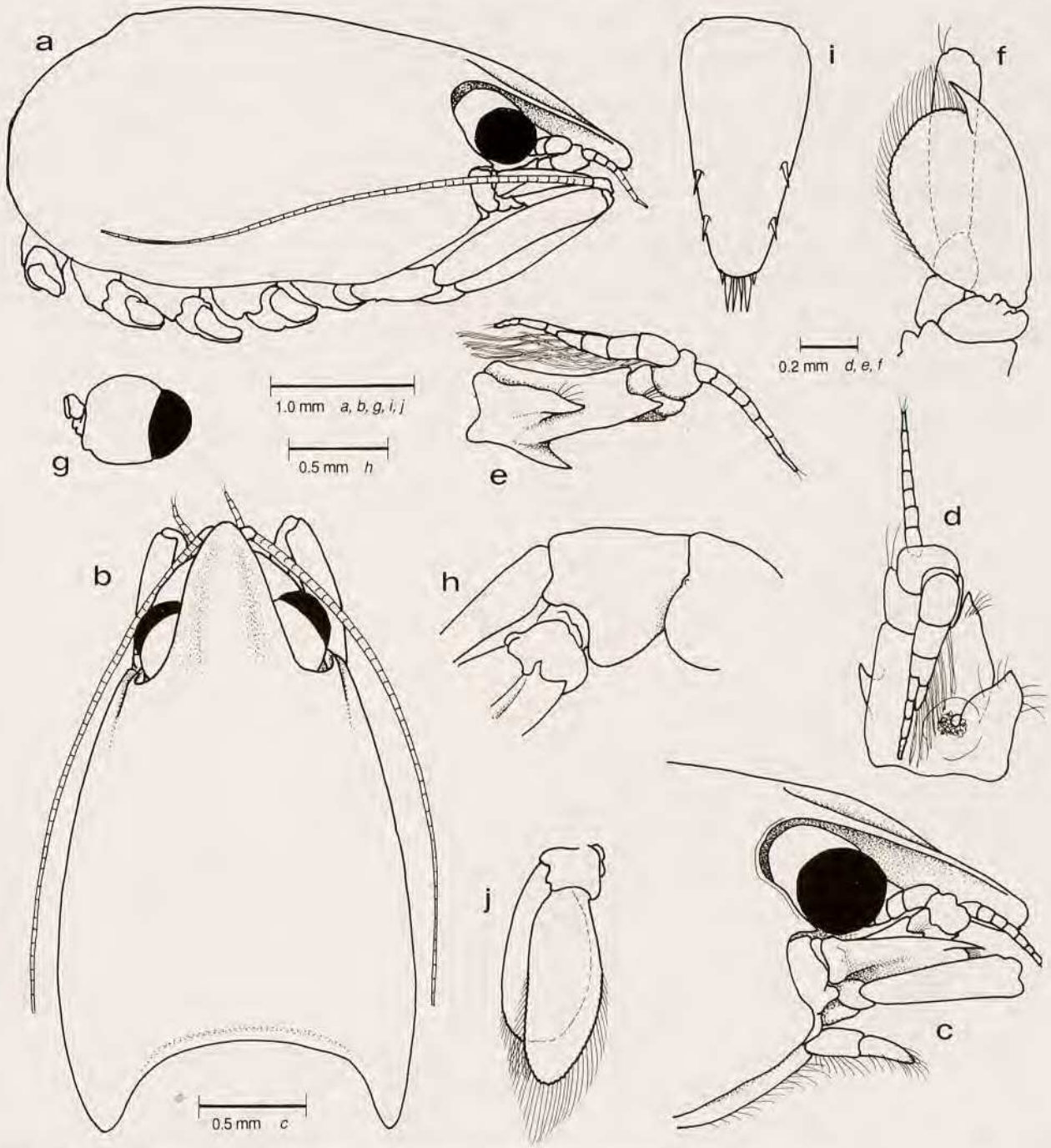

FIG. 15. — *Pontonia compacta* sp. nov., ♀, holotype (MNHN-Na 12851), New Caledonia, 10-46 m : **a**, carapace and appendages, lateral; **b**, same, dorsal; **c**, anterior carapace, antennal peduncles, third maxilliped, lateral; **d**, antennule, dorsal; **e**, same, lateral; **f**, antenna; **g**, eye, dorsal; **h**, posterior abdomen, base of caudal fan, lateral; **i**, telson; **j**, uropod.

palp, lower lobe stout, with small ventral seta; upper lacinia slender, with more simple spines distally, sparse setae; lower lacinia tapering, acute distally with sparse setae. Maxilla with broad non-setose palp; basal endite feebly bilobed, lobes short, sparsely setose, with few simple setae, more deeply divided on left than right, coxal endite obsolete, medial margin feebly concave; scaphognathite narrow, 5.0 times longer than wide, anterior lobe

broader, 1.9 times longer than wide, distally rounded, slightly exceeding palp, medial margin straight, posterior lobe narrower, 3.5 times longer than proximal width, distally expanded. First maxilliped with short slender, non-setose palp, basal endite large, broadly rounded, sparsely provided with long simple setae marginally, coxal endite obsolete, separated from basal by feeble notch, medial margin straight, non-setose, exopod with large caridean lobe, flagellum well developed, slender, distal setae missing; epipod large, triangular, distinctly bilobed. Second maxilliped with normal endopod; dactylar segment narrow, with numerous stout serrulate spines; distomedial propodal segment rounded, with eight simple spines and simple setae, basis angularly produced proximally; exopod with long slender flagellum with six plumose setae distally; coxa feebly bilobed medially, with large, feebly bilobed, triangular epipod laterally. Third maxilliped short, reaching to about 0.3 of carpocerite length; endopod moderately stout, ischiomerus largely fused to basis, combined segment about 3.6 times longer than central width, not expanded, medial margin straight with sparse simple setae, coxal region convex, more sparsely setose; penultimate segment about 1.7 times longer than wide, slightly tapering distally, about 0.5 of antepenultimate segment length, medial border with sparse simple setae; terminal segment small, short, 0.6 of penultimate segment length, about 2.0 times longer than proximal width, tapering distally, with more numerous simple spiniform setae; exopod well developed, with slender flagellum with six plumose distal setae; coxa not medially produced, with large oval epipod, without arthrobranch. Paragnaths with short rounded alae; corpus short, broad, without ventral ornamentation.

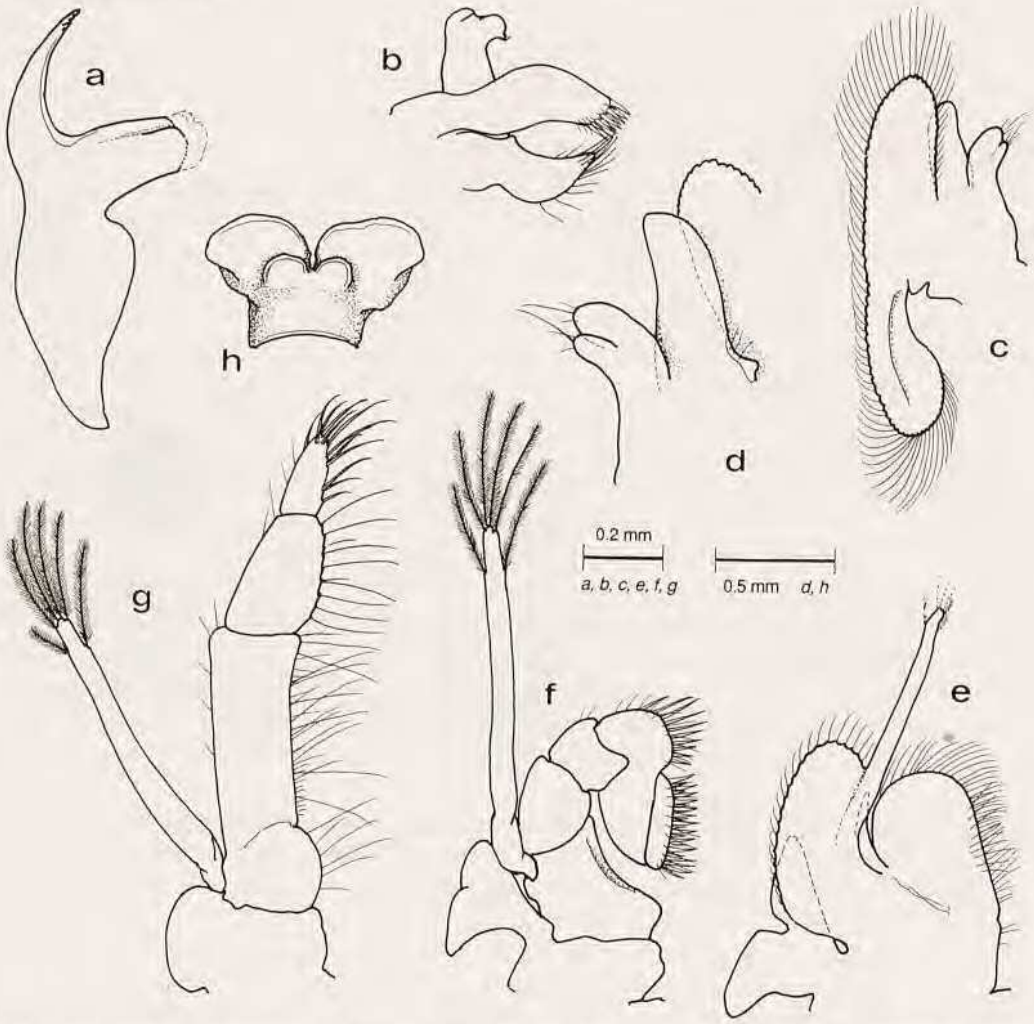

FIG. 16. — *Pontonia compacta* sp. nov., ♀, holotype (MNHN-Na 12851) : **a**, mandible; **b**, maxillula; **c**, maxilla, right; **d**, same, palp, basal endite, left; **e**, first maxilliped; **f**, second maxilliped; **g**, third maxilliped; **h**, paragnaths.

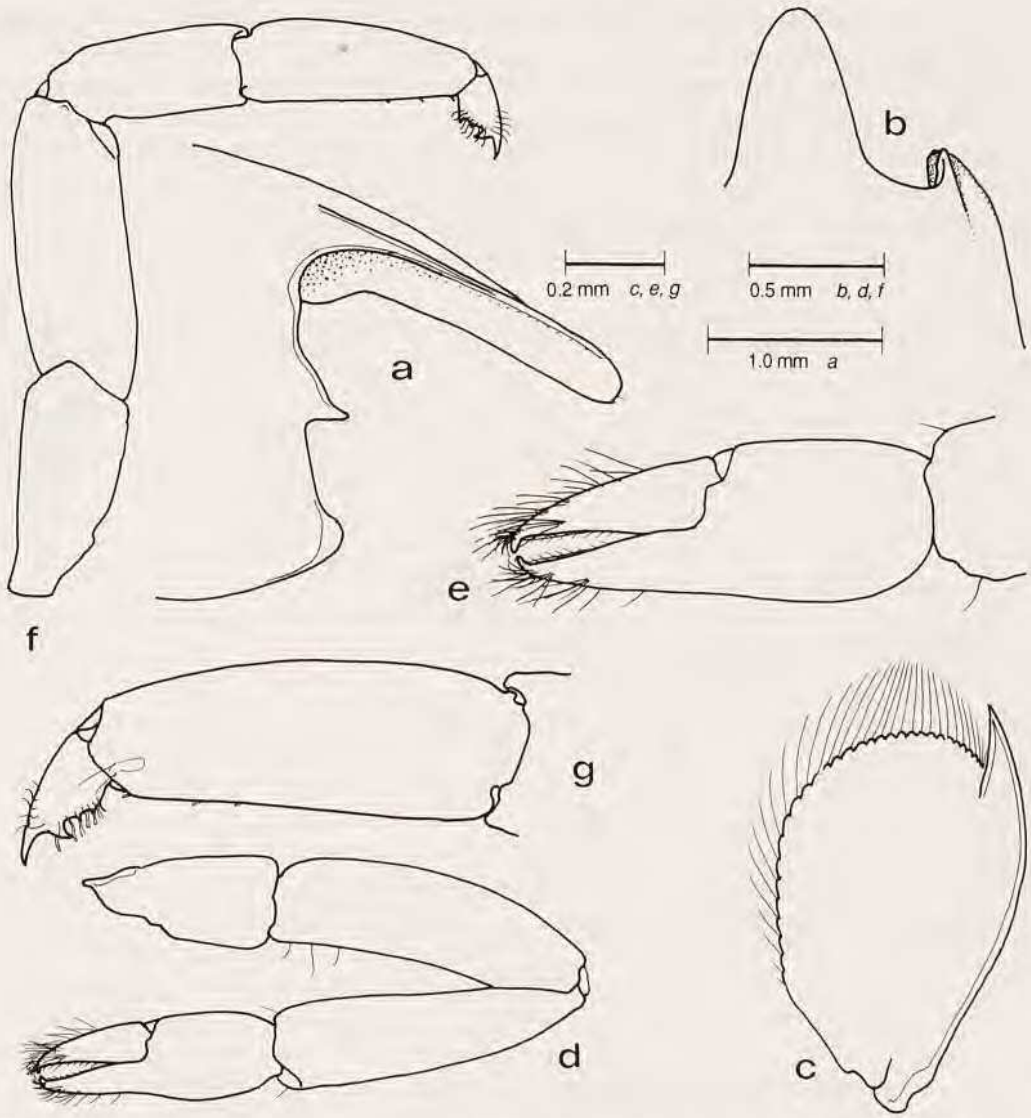

FIG. 17. — *Pontonia compacta* sp. nov., ♀, holotype (MNHN-Na 12851) : **a**, anterior carapace and rostrum, lateral; **b**, same, dorsal; **c**, scaphocerite; **d**, first pereiopod; **e**, same, chela; **f**, third pereiopod; **g**, same, propod and dactyl.

Fourth thoracic sternite without median process.

First pereiopod robust, exceeding carpocerite by chela and carpus; chela with palm about 1.4 times longer than deep, compressed, fingers about 0.9 of palm length, similar, simple, about 3.0 times longer than proximal depth; tapering, with small acute hooked tips, cutting edges entire; carpus about 3.75 times longer than distal width, 1.3 times chela length, feebly tapering proximally; merus stout, 3.4 times longer than wide, uniform, bowed, subequal to carpus length; ischium about 0.6 of merus length; basis and coxa normal.

Second pereiopods missing.

Third ambulatory pereiopod robust; dactyl about 0.3 of propod length, compressed, with clearly demarcated unguis, unguis slender, feebly curved, about 2.4 times longer than basal width, tip with two distodorsal serrations; corpus about 1.6 times longer than deep, dorsal margin feebly convex, ventral border more strongly convex, with large acute recurved, preterminal accessory tooth distally, with small acute anteroverted tooth at about 0.5 of ventral length, ventral margin to base of distal accessory tooth straight, with single small acute tooth, ventral border with seven paired medial and lateral submarginal setae, stout, distally blunt, distodorsolateral corpus with

slender tapering setae; propod about 0.35 of carapace length, with single minute distoventral spine, stout, uniform, acutely truncated distally, with two smaller similar spines on distal ventral border; carpus about 0.8 of propod length, about 2.4 times longer than distal width, with small distodorsal lobe; merus 1.25 times propod length, robust, 2.75 times longer than central depth, unarmed; ischium about 0.75 of meral length, 2.2 times longer than distal width, tapering proximally, unarmed, basis and coxa normal. Fourth and fifth pereiopods missing.

Uropod with posterolateral angle of protopodite rounded; exopod broad, 2.0 times longer than central width, lateral margin feebly convex, with minute spinule distally, without distolateral tooth; endopod far exceeding exopod, 1.1 times exopod length, 2.8 times longer than wide.

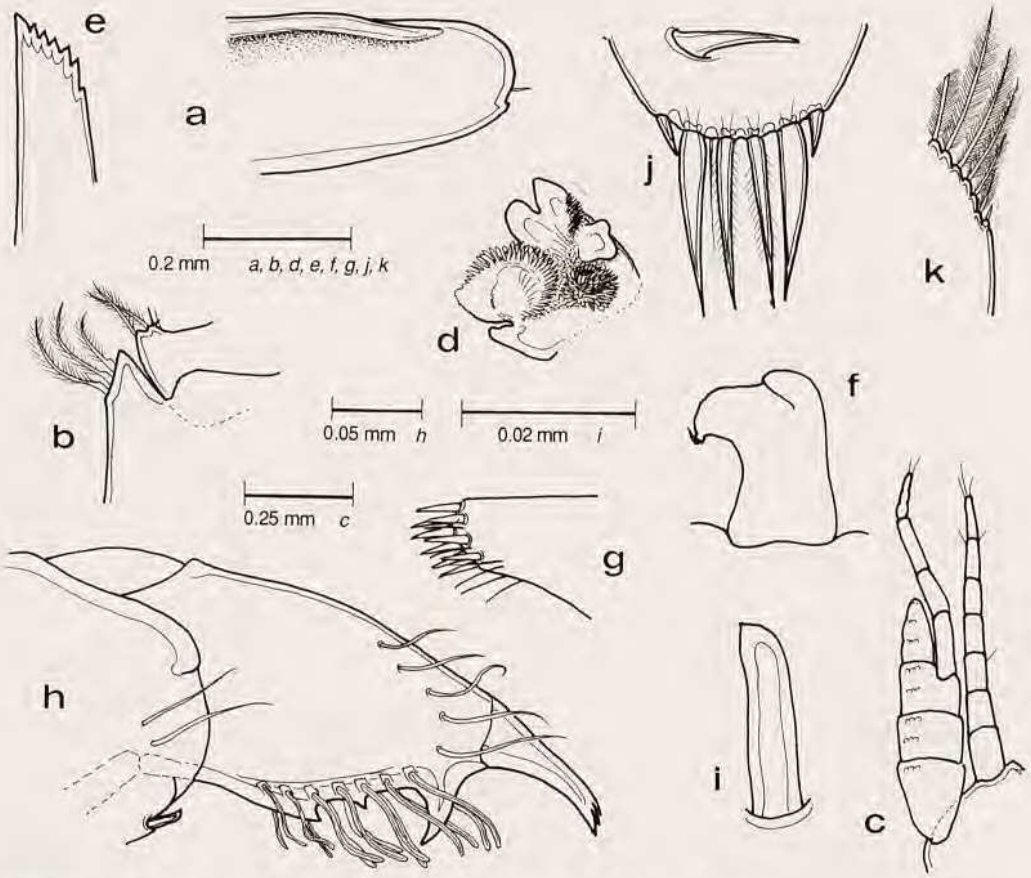

FIG. 18. — *Pontonia compacta* sp. nov., ♀, holotype (MNHN-Na 12851) : **a**, distal rostrum; **b**, distolateral angle of proximal segment of antennular peduncle, ventral aspect; **c**, same, flagella; **d**, mandible, molar process; **e**, same, incisor process; **f**, maxillula, palp; **g**, same, distal upper lacinia; **h**, third pereiopod, distal propod and dactyl; **i**, same, distoventral propodal spine; **j**, telson, posterior spines, (inset, dorsal spine); **k**, uropod, distolateral exopod.

MEASUREMENTS (mm). — Carapace length, 2.5; carapace and rostrum, 3.6.

HOST. — *Pyura albanyensis* Michaelsen, 1927 (Ascidiacea : Pyuridae).

SYSTEMATIC POSITION. — *Pontonia compacta* is most closely related to *P. katoi* Kubo, 1940. It may most easily be distinguished from that species by the differences in spinulation of the telson, which in *P. katoi* has the dorsal spines relatively larger and at about 0.1-0.2 and 0.6 of the telson length. The dorsal spines in *P. compacta* are subequal and distinctly shorter than the intermediate posterior telson spines. In *P. katoi* the anterior dorsal spines appear larger than the posterior dorsal spines and both pairs longer than the intermediate posterior spines in

the type material. In the original description of *P. katoi* the rostrum is described as dorsally carinate, no carina is present in *P. compacta*. The rostrum in *P. compacta* is particularly broad, contrasting with *P. katoi* in which it is distinctly less broad. In *P. katoi* the distolateral spine of the scaphocerite is much more elongate and slender (HOLTHUIS, 1952, fig. 73b) than in *P. compacta*, in which it is relatively short and stout.

Pontonia simplicipes sp. nov.

Figs 19-20, 29 i

MATERIAL EXAMINED. — **Chesterfield Islands**. CORAIL 2 : stn DW 163, 19°15.15'S, 158°47.73'E, 71 m, 24 August 1988, coll. B. RICHER DE FORGES : 1 ♀ holotype (MNHN-Na 12844).

DESCRIPTION. — A small sized pontoniine shrimp of subcylindrical body form.

Rostrum well developed, about 0.65 of carapace length, slightly depressed, extending well beyond antennular peduncle and scaphocerite, to about distal end of carpocerite, broad, with well developed lateral carinae, slightly longer than width at posterior orbital margin, feebly depressed centrally, without dorsal carina or dorsal dentition, lateral carinae with convex margins, anteriorly convergent to blunt tip, ventral carina well developed, except proximally, ventrally convex, unarmed, non-setose. Carapace smooth, glabrous, without epigastric, supraorbital, hepatic or antennal spines, orbit distinct, with posterior extensions of rostral lateral carinae concealing proximal and medial eyestalk, extending to acute inferior orbital angle, with medial inflection, anterolateral angle slightly produced, broadly rounded.

Abdomen smooth, glabrous, pleura of all segments broadly rounded; sixth segment about 1.3 times longer than anterior width, depressed, posteroventral and posterolateral angles blunt, obsolescent. Telson about 2.1 times sixth segment length, 2.6 times longer than anterior margin width, 2.4 times longer than maximum width, lateral margins sub-linear, posteriorly convergent, with two pairs of large lateral subequal dorsal spines, about 0.12 of telson length, at 0.25 and 0.63 of telson length, posterior margin 0.33 of anterior margin width, broadly convex, without median point, with three pairs of spines and sparse setae, lateral spines small, about 0.25 of dorsal spine length, intermediate spines long, slender, about 0.25 of telson length, submedian spines slightly shorter, more slender than intermediate spines, sparsely setulose distally.

Antennule short, stout, robust, peduncle falling well short of rostral tip; proximal segment of peduncle about as long as wide, with large acute distolateral tooth reaching almost to level of proximal margin of distal peduncular segment, with small acute ventromedial tooth; statocyst normal, with granular statolith; stylocerite short, broad, distally acute, reaching to about 0.5 of segment length; intermediate and distal segments short and broad, combined length about 0.75 of proximal segment length; upper flagellum biramous, proximal three segments of rami short, stout, fused, short free ramus reduced to short lobe on distal segment medially, with five groups of aesthetascs, longer ramus with three short segments; lower flagellum short, with five short segments only; upper ramus carried reflexed beneath lateral rostral carina.

Antenna with basicerite short, stout, laterally unarmed, with small, rounded tubercular opening to antennal gland medially; ischiocerite and merocerite normal; carpocerite long, slender, about 5.5 times longer than wide, extending well beyond antennal peduncle, subequal to tip of rostrum; scaphocerite well developed, distinctly exceeding antennular peduncle, reaching to about 0.75 of carpocerite length, about 2.5 times longer than wide, maximum width at about 0.6 of length, lateral margin largely straight, with very large acute medially curved tooth distolaterally, extending beyond anterior margin of lamella, separated from distolateral lamella by deep notch.

Eye with cornea small, oblique, hemispherical with dorsal accessory pigment spot; stalk subcircular, depressed, about 1.2 times wider than long.

Mouthparts with maxilla and maxillipeds only removed on left side. Maxilla with endopod well developed, broad, laminar, non-setose, reaching to about 0.6 of anterior lobe of scaphognathite; basal endites reduced, feebly bilobed, upper lobe much larger than lower, both with two simple setae only; coxal margin broadly convex; scaphognathite well developed, broad, about 2.7 times longer than wide, posterior lobe about 2.2 times longer than wide, anterior lobe 1.3 times longer than wide, anteromedial border feebly emarginate. First maxilliped with short

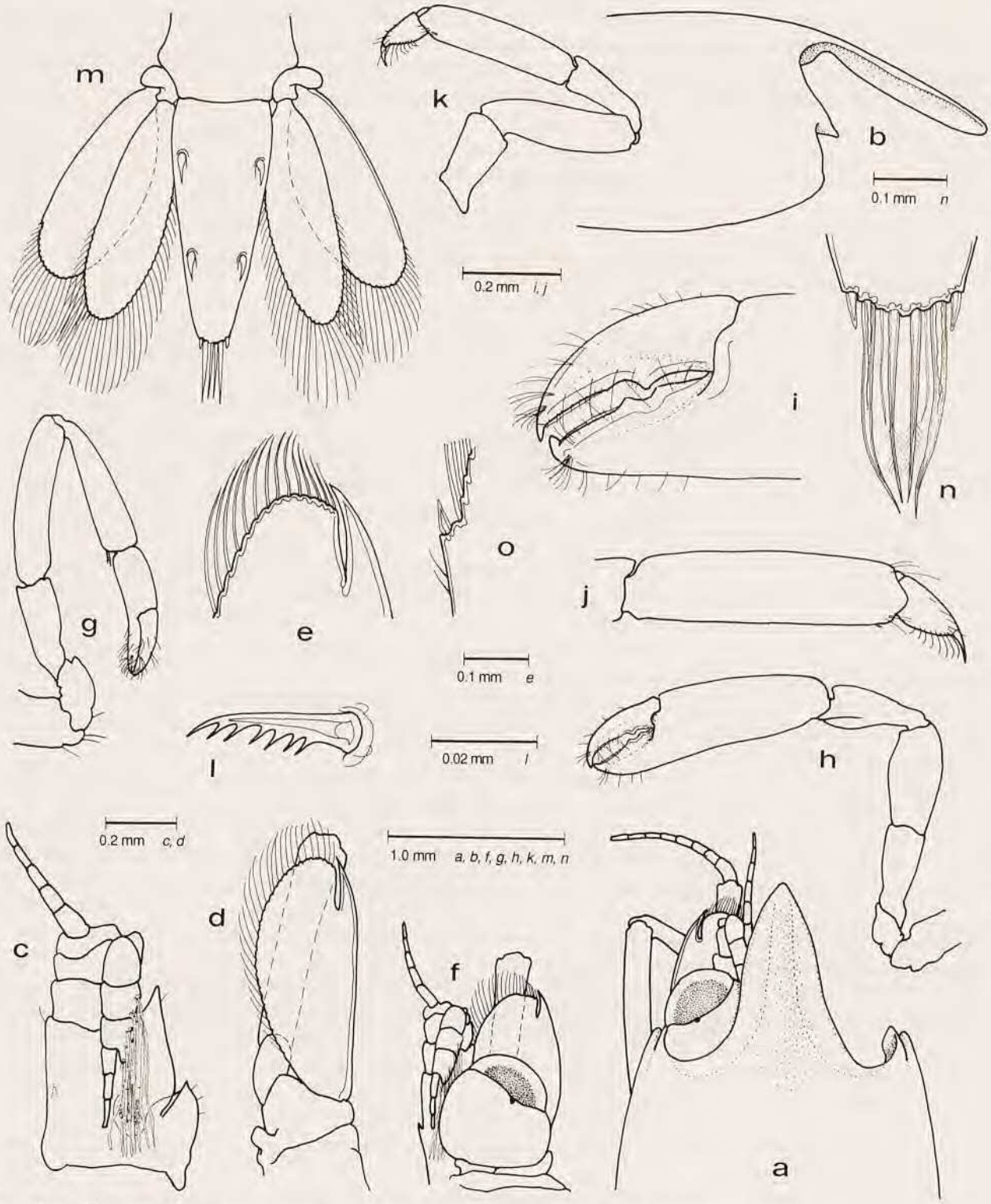

FIG. 19. — *Pontonia simplicipes* sp. nov., ♀, holotype (MNHN-Na 12844), Chesterfield Islands, 71 m : **a**, anterior carapace, rostrum, left eye, antennule, dorsal; **b**, anterior carapace and rostrum, lateral; **c**, antennule; **d**, antenna; **e**, distal scaphocerite; **f**, right eye, antennae; **g**, first pereiopod; **h**, second pereiopod; **i**, same, fingers of chela; **j**, third pereiopod, propod, dactyl; **k**, fifth pereiopod; **l**, same, distolateral propodal spine; **m**, caudal fan; **n**, posterior telson spines; **o**, uropod, posterolateral angle of exopod.

blunt, non-setose palp, basal endite broad, rounded, sparsely setose, with small proximal lobe; exopod with large broad caridean lobe, flagellum slender, with four long plumose distal setae; coxal endite with convex non-setose medial margin, epipod bilobed, lobes rounded. Second maxilliped of normal form, basis with angular proximomedial projection; exopod well developed, flagellum slender, with four long plumose distal setae, epipod triquetral, without podobranch. Third maxilliped with endopod short, broad; ischiomerus distinct from basis, about 2.5 times longer than broad, sparsely setose, with simple setae medially, with longitudinal row of minute spinules proximomedially; intermediate segment about 0.3 of ischiomeral length, as wide as long, with few long robust setae medially; terminal segment about 1.5 times length of penultinate segment, tapering distally, about 2.3 times longer than proximal width; basis not medially produced, non-setose, exopod with slender flagellum, with four long plumose distal setae; coxa large, robust, medially inclined with small oval lateral plate, without arthrobranch.

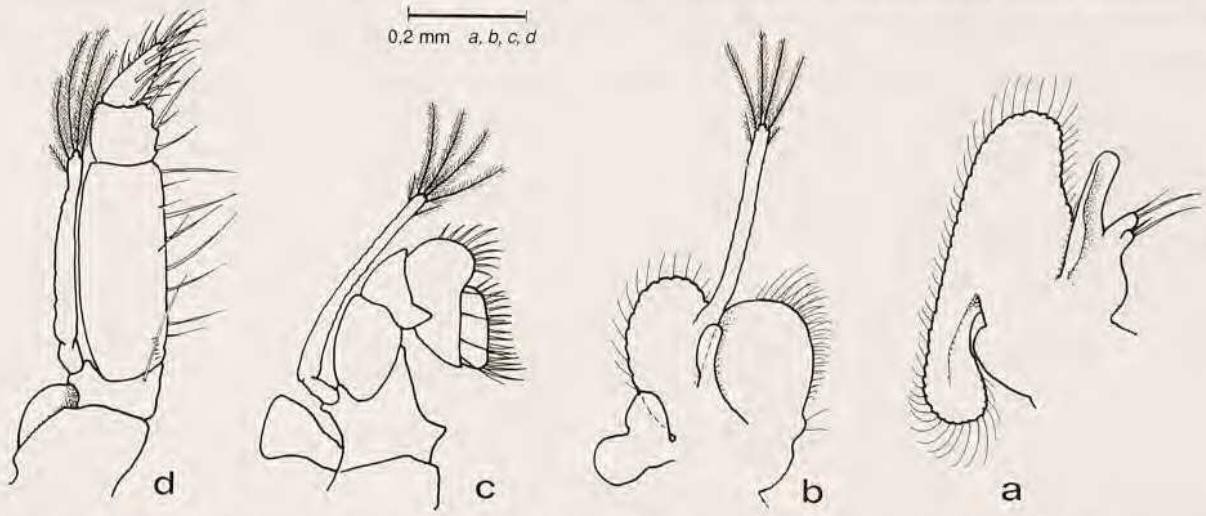

FIG. 20. — *Pontonia simplicipes* sp. nov., ♀, holotype (MNHN-Na 12844), mouthparts : **a**, maxilla; **b**, first maxilliped; **c**, second maxilliped; **d**, third maxilliped.

First pereiopod robust; chela with palm about 2.0 times longer than deep, subcylindrical, fingers subequal to palm length, stout, with lateral entire cutting edges, small acute hooked tips; carpus about 1.2 times chela length, 4.4 times longer than distal width, tapering proximally; merus 1.1 times carpal length, uniform, bowed, about 4.5 times longer than central width; ischium about 0.6 of meral length; basis and coxa normal.

Second pereiopods subequal, similar, small; chela about 1.15 times the carapace length; palm smooth, compressed, about 3.0 times longer than distal width, fingers compressed, dactylus about 0.55 of palm length, 3.3 times longer than proximal depth, with acute hooked tip, distal cutting edge entire, sharp, proximal cutting edge with single large blunt tooth distally, fixed finger similar, about 1.7 times longer than deep, with two low, subacute teeth centrally, distal cutting edge entire, sharp; carpus about half palm length, 2.5 times longer than distal width, feebly swollen centrally, unarmed; merus 0.66 of palm length, 2.0 times longer than central width, centrally swollen unarmed; ischium subequal to meral length, 2.5 times longer than distal width, tapering proximally, unarmed; basis normal, coxa elongate.

Ambulatory pereiopods robust. Third pereiopod with propod stout, compressed, 4.0 times longer than deep, with minute lateral distoventral spinules and distal ventral spinule only, with sparse simple setae; dactyl about 0.37 of propod length, unguis clearly demarcated, slender, curved, about 4.0 times longer than basal width, 0.33 of corpus length, corpus about 1.9 times longer than proximal depth, tapering strongly distally, dorsal margin convex, ventral margin unarmed, with distal accessory tooth, uniformly convex, with nine paired, stout distally blunt, submarginal setae, further tapering setae also present distodorsolaterally; carpus about 0.55 of propod length, unarmed; merus subequal to propod length, 4.0 times longer than deep, uniform, unarmed; proximal segments without special features. Fourth and fifth pereiopods similar. Propod of fifth pereiopod with single small pectinate lateral distal spine only.

Uropods with protopodite posterolaterally blunt; exopod 2.5 times longer than broad, lateral margin feebly convex with small mobile spinule distolaterally, without distolateral tooth; endopod, subequal to endopod length, 3.4 times longer than wide.

MEASUREMENTS (mm). — Carapace length, 1.33; carapace and rostrum, 2.2; second pereiopod chela, 1.3.

HOST. — *Polycarpa nigricans* Heller, 1878 (Ascidiacea : Styelidae).

SYSTEMATIC POSITION. — *Pontonia simplicipes* is not closely related to most other species of the genus which have ornate dactyls, often elaborately dentate, on the ambulatory pereiopods. Other species have at least a strong distal accessory tooth so that the dactyl presents a biunguiculate appearance. Of the Indo-West Pacific species, *P. simplicipes* is most closely related to *P. ardeae* Bruce, 1981. This species is the only Indo-West Pacific species known to associate with a bivalve mollusc host, *Chama pacifica* Broderip. All other Indo-West Pacific species of which the host animals are known are associated with simple ascidians. The ascidian-associated species have multidentate ambulatory dactyls. *P. ardeae* has a simple biunguiculate dactyl, albeit a highly setose one, that readily distinguishes it from *P. simplicipes*.

ETYMOLOGY. — From *simplex* (Latin), simple; *pes* (Latin), foot, with reference to the dactyl of the ambulatory pereiopod.

Genus ***THAUMASTOCARIS*** Kemp, 1922

Thaumastocaris streptopus Kemp, 1922

Fig. 21

Thaumastocaris streptopus Kemp, 1922 : 244-247, figs 78-80. — BRUCE, 1980 : 13-15, fig. 5d-f; 1991 a : 258, fig. 21.

MATERIAL EXAMINED. — **New Caledonia**. 1 mile east of Kouaré, 32 m, SCUBA diving : 1 ♂, 1 ovig. ♀ (MNHN-Na 12879).

Comoro Islands. BENTHEDI : stn R 32, Mayotte, north of Pamanzi Island, 12°45.1'S, 45°17.9'E, 15-20 m, dredge, 25 March 1977 : 3 juv. (MNHN-Na 12898); 1 ? post-larva (MNHN-Na 12899).

REMARKS. — The New Caledonian specimens lack only the minor second pereiopod in the case of the male. The male specimen has a carapace length of 11.6 mm and a rostral dentition of 12/3 or 11/4, and the female 13.2 mm, with a rostral dentition of 10/3 or 9/4, both having the four posterior teeth situated on the carapace. The specimens were obtained from an unidentified sponge. The species was first described and has been repeatedly reported from New Caledonian waters.

The species has not been previously reported from the Comoro Islands. The juvenile specimens have carapace lengths of 3.2-4.6 mm and a rostral dentition of ♂ 11/2; ♀ 10/3, 8/3, all with the first two teeth situated posteriorly to the orbital margin. In these small specimens the first pereiopods are distinctly slender and the second pereiopods markedly unequal.

The ? post-larval specimen has a carapace length of 1.5 mm and differs in several respects from older specimens. The mouthparts are basically as described by HOLTHUIS (1952), but the first maxilliped has the epipod with two more rounded lobes and the second maxilliped has an angular medial projection from the basis. The rostrum is horizontal, with nine small acute dorsal teeth, uniformly distributed along the margin of the low dorsal carina, all anterior to the posterior margin of the carapace. Its ventral carina bears two smaller acute teeth distally. The inferior orbital angle and antennal spine are distinct; epigastric and hepatic spines are absent. The eye is relatively large, with the corneal diameter about 0.38 of the carapace length. The first pereiopods are subequal, relatively short and stout, quite in contrast to the slender pereiopods of the adults. The basis bears a rudimentary exopod. The chela and carpus are subequal in length and the carpus shows a feeble indication of subdivision into

two articles. The second pereiopods are subequal, similar, with the chelae slightly shorter than the carapace length, with the palm smooth and the fingers unarmed, in contrast to the adults. The ambulatory pereiopods have the dactylus strongly biunguiculate, very much as in the adults, with a very acute distal accessory tooth, and the propod bears a single distoventral spine only. The endopod of the second pleopod bears a well developed appendix masculina. The corpus is slender, subcylindrical, about 0.2 of the endopod length, arising at about 0.33 of the endopod length, with a single robust, feebly setulose, terminal spine reaching almost to the tip of the endopod.

The presence of rudimentary exopods on the first pereiopods suggests that this specimen is the first post-larval stage, and the presence of definite appendix masculina indicates that its sex is already determined at this stage. The rostrum differs markedly from the adults of *T. streptopus*, but the identification of this specimen with that species is supported by the similarity of the mouthparts, the dactyl of the ambulatory pereiopods, the incipient segmentation of the first pereiopod carpus, and the presence in the same catch of juvenile specimens of *T. streptopus*.

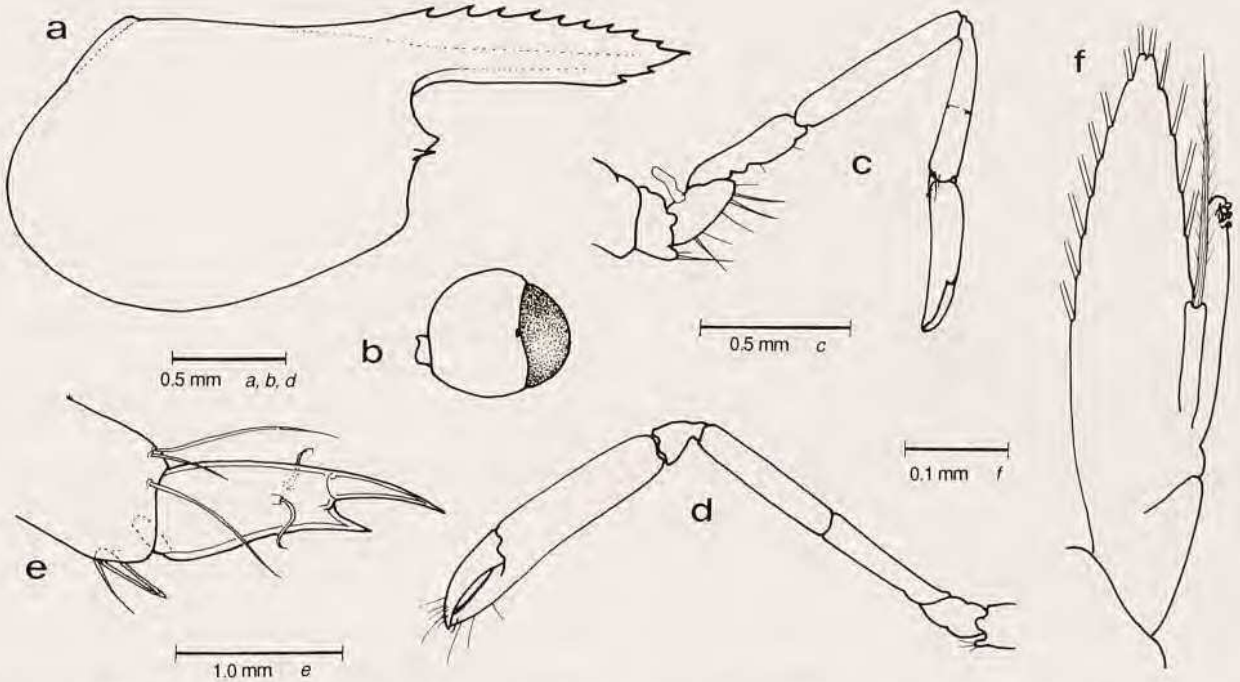

FIG. 21. — *Thaumastocaris streptopus* Kemp, ? post-larva (MNHN-Na 12899) : **a**, carapace, rostrum; **b**, eye, dorsal; **c**, first pereiopod; **d**, second pereiopod; **e**, third pereiopod, distal propod, dactyl; **f**, second pleopod, endopod.

DISTRIBUTION. — Type locality : Nouméa, New Caledonia. Also known from Jordan; Sudan; Somalia; Kenya; Zanzibar; Tanzania; Madagascar; Indonesia; Philippines; Great Barrier Reef, Australia; Caroline Islands; Marshall Islands.

Genus ***TYPTONYCHUS*** nov.

DEFINITION. — Small sized shrimps of subcylindrical body form. Rostrum distinct, dorsally dentate, lateral carinae feebly developed. Carapace smooth, supraorbital, epigastric, hepatic and antennal spines absent, inferior orbital region acutely produced, anterolateral angle of branchiostegite produced, rounded. Abdomen smooth with three anterior pleura broadly rounded, fourth and fifth broadly rounded or acutely posteriorly produced, posterolateral angles of sixth segment acutely produced. Telson with one or two pairs of dorsal spines, three pairs of posterior

spines. Antennae reduced, antennule with scaphocerite rudimentary. Mandible small, without palp, incisor process with 1-3 small acute distal teeth or reduced. Maxilla with elongate simple basal endite with dense medial setal fringe, palp broad. First maxilliped with simple palp, basal and coxal endites fused, elongate, dorsally concave, with dense fringe of long setae medially, exopod well developed with broad flagellum and caridean lobe, epipod simple. Second maxilliped with normal endopod, flagellum of exopod broad, epipod simple, without podobranch. Third maxilliped with endopod short, robust, ischiomerus distinct from basis, rotated laterally, bowed, ventrally tuberculate or with dense setal fringe, coxa with oval lateral plate, without arthrobranch. Fourth thoracic sternite without median process. First pereiopods slender, chelae with simple fingers, coxae with or without lobe with dense setal tuft. Second pereiopods unequal, dissimilar, major chela with fingers lacking molar process and fossa, strongly dentate distally; minor chela with fingers shearing, unarmed. Ambulatory pereiopods with dactyls biunguiculate, ventral border of corpus feebly denticulate. Male second pleopod with corpus of appendix masculina reduced. Uropods normal, exopod with small distolateral tooth with small mobile spinule medially.

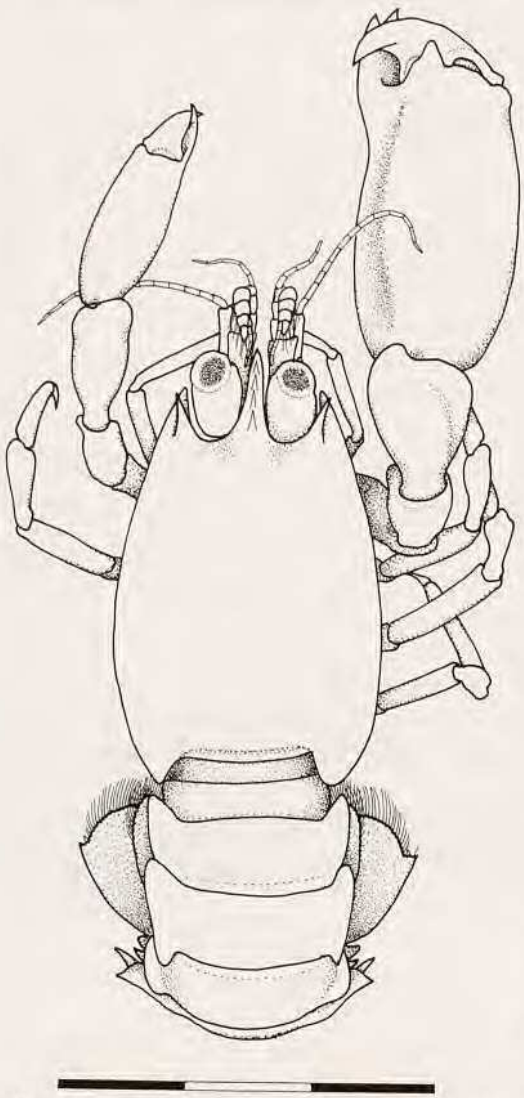

FIG. 22. — *Typtonychus crassimanus* gen. nov., sp. nov., holotype ♂ (MNHN-Na 12845), Anaa, New Caledonia, 38 m, dorsal. Scale divisions in millimeters.

TYPE SPECIES. — *Typtonychus crassimanus* sp. nov.

SYSTEMATIC POSITION. — The genus *Typtonychus* is most closely related to the genus *Typton* Costa, 1844, with which it shares the presence of a rudimentary scaphocerite and shearing fingers on the chela of the minor second pereiopod. No other pontoniine genera have been reported to have shearing fingers on the minor second pereiopod other than *Pontonia* Latreille, 1829, and only the coral gall-inhabiting genus *Paratypton* Balss, 1914, is also known to have a rudimentary scaphocerite. *Typtonychus* shows no evidence of any close relationship to *Paratypton*, as indicated by the radically different structure of the mouthparts in the two genera. *Typtonychus* may be distinguished from the genus *Typton* by the presence of the elongate basal endites of the maxilla and first maxilliped, both with their dense medial fringes of short and long setae respectively, forming a dorsally concave basket-like structure. In *Typton* the second pereiopods typically have the fingers of the major chela simply acute, not with large paired acute teeth as in *Typtonychus*. *Typtonychus* is readily distinguished from *Pontonia* by its characteristic mouthparts, as well as the morphology of the major second pereiopod chela, which has compressed, simple fingers.

Typtonychus appears to be also closely related to *Onycocaris* Nobili, 1904, in which the second pereiopod chelae have fingers with very strongly developed, often paired and very acute, distal teeth, in general showing some similarity to the major chela in *Typtonychus*. *Onycocaris* lacks the characteristic maxilla and first maxilliped of *Typtonychus* and also possesses a normally developed antennal scaphocerite. *Onycocaris* species usually also possess elaborately ornate dactyls on the ambulatory pereiopods, which are not found in *Typtonychus*.

The presence of acutely produced pleura on the fourth and fifth abdominal segments has been considered as a

character of sufficient systematic value to isolate some genera (i.e., *Dasycaris* Kemp, *Harpiliopsis* Borradaile) from other pontoniine genera (HOLTHUIS, 1955). This separation is supported by further specialized characters, so that there is no doubt concerning the validity of these genera. The presence of acutely produced fourth and fifth pleura in the type species of *Typtonychus*, but not in the associated species of the new genus, in the absence of other major differences, allows the species to be included in the same genus.

ETYMOLOGY. — A partial amalgam based on the pontoniine generic names *Typton* and *Onycocaris*, first used by COSTA (1844) and NOBILI (1904).

INCLUDED SPECIES. — The following species are now removed from the genus *Typton* and included in the genus *Typtonychus* :

1. *Typtonychus anomalus* (Bruce, 1979) comb. nov.
2. *Typtonychus dentatus* (Fujino & Miyake, 1969) comb. nov.
3. *Typtonychus dimorphus* (Bruce, 1986) comb. nov.

Typtonychus crassimanus sp. nov.

Figs 22-27

MATERIAL EXAMINED. — **New Caledonia**. SMIB 5 : Anaa Reef (21°22,70'S, 166°01,50'E, 38 m, SCUBA diving, 11 September 1989 : 1 ♂ holotype (MNHN-Na 12845).

DESCRIPTION. — Small sized pontoniine shrimp of robust, subcylindrical body form.

Rostrum small, short, acute, compressed, not exceeding distal margin of proximal segment of antennal peduncle, with four similar acute dorsal teeth, all anterior to posterior orbital margin, lateral carinae feebly developed, ventral carina obsolete, ventral surface flattened, ventral border straight, unarmed, non-setose. Carapace smooth, glabrous; supraorbital, epigastric, and hepatic spines lacking; antennal spine acute, inferior orbital angle obsolete; orbital notch well developed, orbit feebly developed; anterolateral angle of branchiostegite produced, rounded; posterior margin broadly rounded.

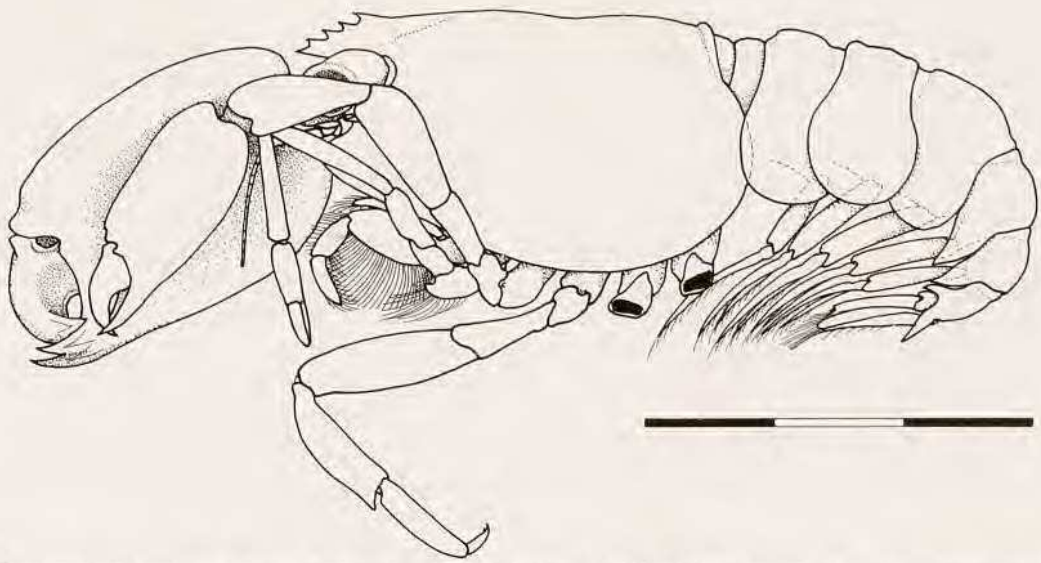

FIG. 23. — *Typtonychus crassimanus* gen. nov., sp. nov., ♂, holotype (MNHN-Na 12845), New Caledonia, 38 m, lateral. Scale divisions in millimeters.

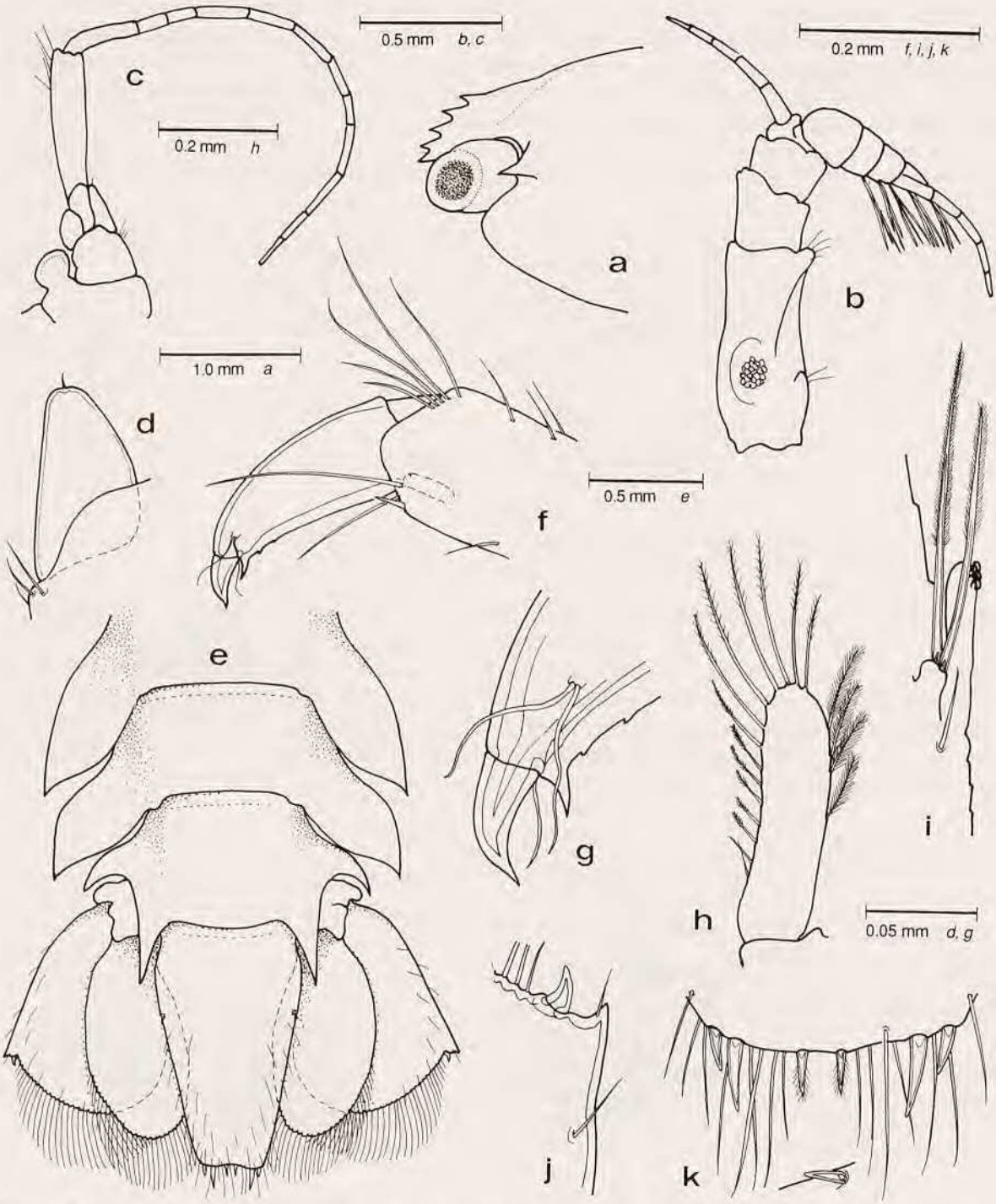

FIG. 24. — *Typtonychus crassimanus* gen. nov., sp. nov., ♂, holotype (MNHN-Na 12845) : **a,** anterior carapace, rostrum, eye; **b**, antennule; **c**, antenna; **d**, scaphocerite; **e**, posterior abdomen and caudal fan; **f**, third pereiopod, distal propod, dactyl; **g**, same, distal dactyl; **h**, first pleopod, endopod; **i**, second pleopod, appendix interna, appendix masculina; **j**, uropod, distolateral exopod; **k**, posterior telson spines, (inset : dorsal spine).

Abdomen smooth, glabrous; third segment not posterodorsally produced; pleura of first three segments small, broadly rounded, fourth and fifth large, acutely posteriorly produced; sixth segment about 1.2 times length of

fourth segment, anterior width about 1.25 times length, posteroventral angle strongly produced, posteriorly recurved, posterolateral angle enlarged, acute, straight, directed posteriorly, reaching about 0.25 of telson length. Telson sparsely setose dorsally, extending well beyond posterior ends of uropods, about 1.7 times sixth segment length, 1.65 times longer than anterior width, lateral margins sub-linear, posteriorly convergent, with one pair of small marginal spines, at about 0.37 of telson length; posterior margin truncate, straight, about 0.4 of anterior telson width, with three pairs of spines and scattered setae, lateral spines small, subequal to dorsal spines, intermediate spines adjacent to lateral spines, about twice as long, separated by interval from submedian spines, subequal to lateral spine length, more slender, setulose.

Antennule short, with reduced flagellum, proximal segment of peduncle about 2.7 times longer than central width, robust, feebly compressed, distolateral angle unarmed, without ventromedial tooth, statocyst normal, with granular statolith, stylocerite reduced, distally blunt, reaching to about 0.3 of segment length, distal segments of peduncle subcylindrical, together equal to about 0.5 of first segment length, distal segment slightly smaller than intermediate; upper flagellum biramous, carried in dorsally flexed attitude, with proximal three segments fused, stout; short free ramus with single segment, longer ramus with five segments; with five groups of aesthetascs; carried in dorsally flexed attitude; lower flagellum short, with five segments.

Antenna reduced; basicerite unarmed; carpocerite subcylindrical, extending to about distal border of intermediate segment of antennular peduncle; flagellum short, with 12 segments; scaphocerite greatly reduced, scarcely exceeding scaphocerite, about 2.0 times longer than wide, tapering, distally rounded, without distolateral tooth, with single short simple seta distally, aperture of antennal gland globular, pedunculate.

Eye normally developed, extending almost to level of tip of rostrum; cornea hemispherical, oblique, without accessory pigment spot, diameter slightly less than that of stalk; stalk subcylindrical, not medially flattened.

Mandible small, feeble, without palp; molar process (right) obliquely truncate distally, with peripheral border of short spinules; incisor process normal, tapering distally, with four small acute teeth distomedially. Maxillula with feebly bilobed palp, upper lobe small, non-setose, lower lobe larger, with single small curved spinule ventrally; upper lacinia short, broad, with about 10 short spines, numerous setae distally; lower lacinia short, bluntly angular, densely setose. Maxilla with elongate palp, tapering, centrally expanded, flattened, with two short plumose setae distally; basal endite elongate narrow, deeply concave dorsally when unflattened, medial margin straight, densely fringed with short, stiff setae; coxal endite distinct, small, non-setose; scaphognathite normal, about 3.5 times longer than central width, anterior lobe 1.7 times longer than wide, medial border emarginate, posterior lobe elongate, narrow, about 0.9 of anterior lobe length, 5.0 times longer than proximal width. All maxillipeds with well developed, broad, strap-like exopods, with numerous plumose setae distally. First maxilliped with elongate, strap-like endopod, with numerous short setae distally; basal endite elongate, narrow, deeply concave dorsally, medial margin with dense palisade of long finely plumose, dorsally curved setae, with submarginal row of stiffer, more sparse, simple setae ventrally; exopod with elongate, narrow caridean lobe; coxal endite distinct, small, non-setose; epipod large, simple, suboval, posteriorly elongate. Second maxilliped normal, dactylar segment with numerous long, coarsely serrate spines, propodal segment with several similar spines at distomedial angle, coxa not medially produced; epipod small, suboval, without podobranch. Third maxilliped small, endopod short, reaching to about middle of carpocerite, ischiomerus and basis completely fused, without indication of junction, broadly expanded, non-operculate, 2.0 times longer than central width, bowed and twisted distally, tapering distally, distal width about 0.3 of central width, medial margin densely fringed with numerous very long, slender, sparsely setulose setae, extending round distal margin, passing ventrolaterally to penultimate segment; penultimate segment about 0.4 of combined proximal segment length, about 2.1 times longer than central width, expanded distoventrally with long ventromedial setae, especially distoventrally; terminal segment about 0.5 of combined proximal segment length, 3.5 times longer than proximal width, feebly curved, tapering distally, with numerous serrulate spiniform setae distoventrally; exopod with short plumose setae along entire lateral border; coxa not medially produced, stout, with sub-oval lateral plate, without arthrobranch. Paragnaths (damaged in dissection) with rounded alae.

Thoracic sternites narrow, unarmed, fourth sternite without median process.

First pereiopod slender, exceeding carpocerite by chela and carpus; chela with palm subcylindrical, slightly compressed, 2.0 times longer than deep, fingers slender, feebly spatulate, with feebly bidentate tips, cutting edges

entire; carpus 1.4 times chela length, 5.2 times longer than distal width, tapering proximally; merus about 1.1 times carpus length, 5.0 times longer than central width; ischium and basis normal, basis with transverse band of short setae proximoventrally; coxa robust, with ventral lobe and ventral border densely setose.

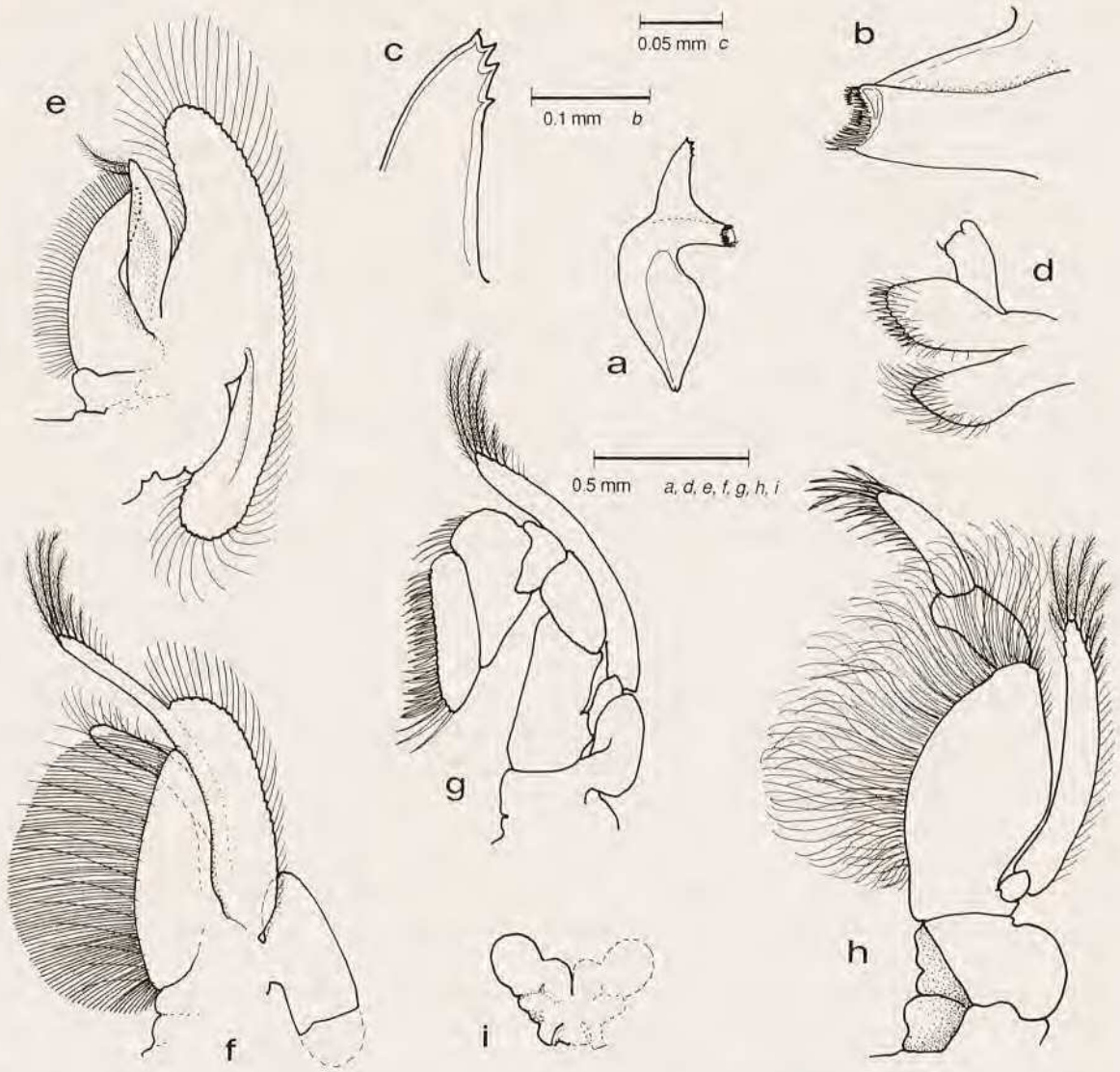

FIG. 25. — *Typtonychus crassimanus* gen. nov., sp. nov., ♂, holotype (MNHN-Na 12845): **a**, mandible; **b**, same, molar process; **c**, same, incisor process; **d**, maxillula; **e**, maxilla; **f**, first maxilliped; **g**, second maxilliped; **h**, third maxilliped; **i**, paragnaths.

Second pereiopods well developed, grossly unequal, dissimilar. Major chela (right) massive, palm subequal to carapace length, smooth, glabrous, subrectangular in section, vertically compressed, with dactyl dorsally, with medial surface concave, about 1.25 times longer than deep, fingers about 0.5 of palm length, dactylus very stout, about 1.5 times longer than proximal depth, strongly curved, medially concave, transversely truncate distally, scoop shaped, with two large flattened acute teeth, fixed finger similar, shorter, both fingers with short entire sharp lateral cutting edges; carpus about 0.4 of chela length, 1.6 times longer than central width, distally expanded, unarmed, tapered proximally; merus about 0.3 of palm length, 1.5 times longer than central width, unarmed, ventral margin expanded, convex, with four small subacute tubercles; ischium about 0.33 of chela length,

2.4 times longer than distal width, slightly tapered proximally, unarmed, ventral margin entire; basis and coxa robust, without special features. Minor chela (left) slender, 0.66 of major chela length; sub-oval in section, palm 2.0 times longer than deep, slightly swollen centrally, smooth, glabrous, fingers slender, dactylus curved, about 2.6 times longer than deep, with strong acute tip, feebly bidentate, cutting edge straight entire, fixed finger 1.5 times longer than proximal depth, with strong acute tip, feebly bidentate, with entire medial shearing cutting edge; carpus about 0.8 of palm length, 2.0 times longer than deep, expanded distally, tapered proximally, unarmed; merus about 0.75 of carpal length, 1.6 times longer than wide, slightly expanded centrally, ventral margin convex with two feeble denticles, unarmed; ischium about 1.5 times meral length, 2.8 times longer than distal width; basis and coxa normal, robust.

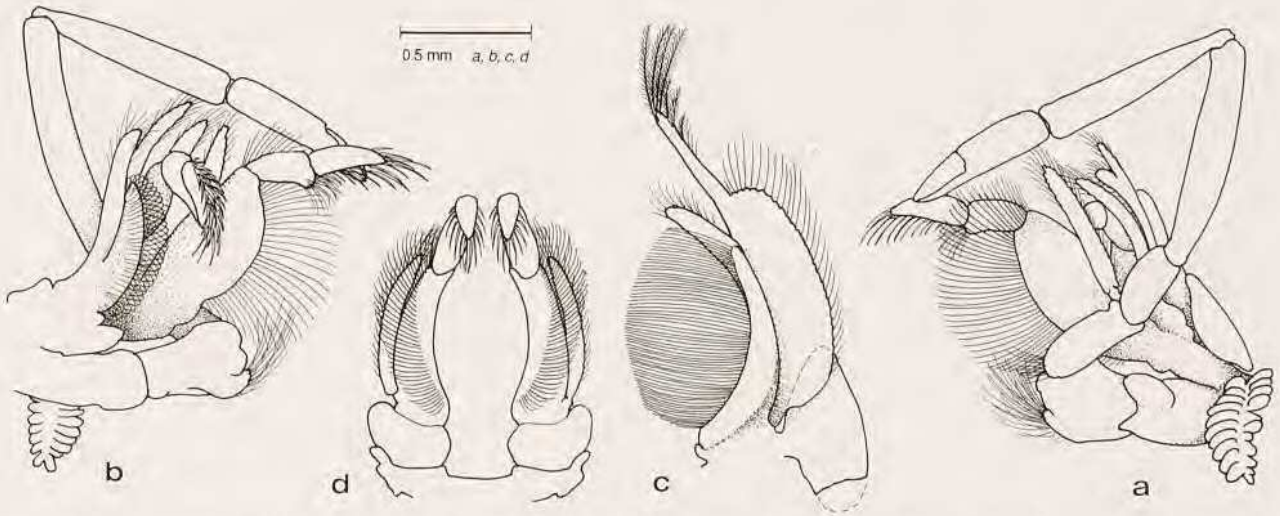

FIG. 26. — *Typtonychus crassimanus* gen. nov., sp. nov., ♂, holotype (MNHN-Na 12845) : **a**, maxilliped and first pereiopod, lateral; **b**, same, medial; **c**, first maxilliped, unflattened; **d**, third maxillipeds, ventral aspect.

Ambulatory pereiopods robust. Third pereiopod exceeding basicerite by dactyl propod and carpus; dactyl compressed, short, curved, about 0.5 of propod length, unguis distinctly demarcated, about 2.0 times longer than basal width, dorsal margin slightly sinuous, extremely acute, corpus about 2.3 times longer than basal width, dorsal margin strongly convex, ventral border sharp, sublinear, with slender, acute, anteroverted accessory tooth distally, with two minute distal ventral denticles, with medial and lateral sensory setae distally; propod 4.2 times longer than proximal width, slightly tapering distally, with single small distoventral spine only, sparsely setose; carpus about 1.4 times propod length, robust, 4.0 times longer than central width; merus about 1.1 times carpus length, robust, 3.1 times longer than central width, unarmed; ischium about 0.6 of merus length, 2.8 times longer than proximal width, tapering proximally; basis and coxa without special features. Fourth and fifth pereiopods similar to third.

First pleopod with endopod 3.5 times longer than width, proximal margins subparallel, distally rounded, without medial accessory lobe, central medial margin with eight spiniform, distally finely serrulate setae, distomedially with six long distally feebly setulose setae, distolaterally four short plumose setae; exopod and basipodite without special features. Second pleopod with endopod subequal to exopod, about 3.4 times longer than wide with appendices at about 0.3 of medial margin length; appendix masculina with corpus greatly reduced, about as long as wide, with two long setulose terminal spines, about 0.4 of endopod length, with single short simple spine proximally on endopod; appendix interna normal, about 3.0 times length of corpus of appendix masculina.

Uropod with protopodite laterally unarmed; exopod broad, 1.4 times wider than length, lateral margin proximally convex, distally straight, unarmed, with small acute tooth distally, with small mobile spinule medially, dieresis obsolete; endopod subequal to exopod length, 2.0 times longer than wide.

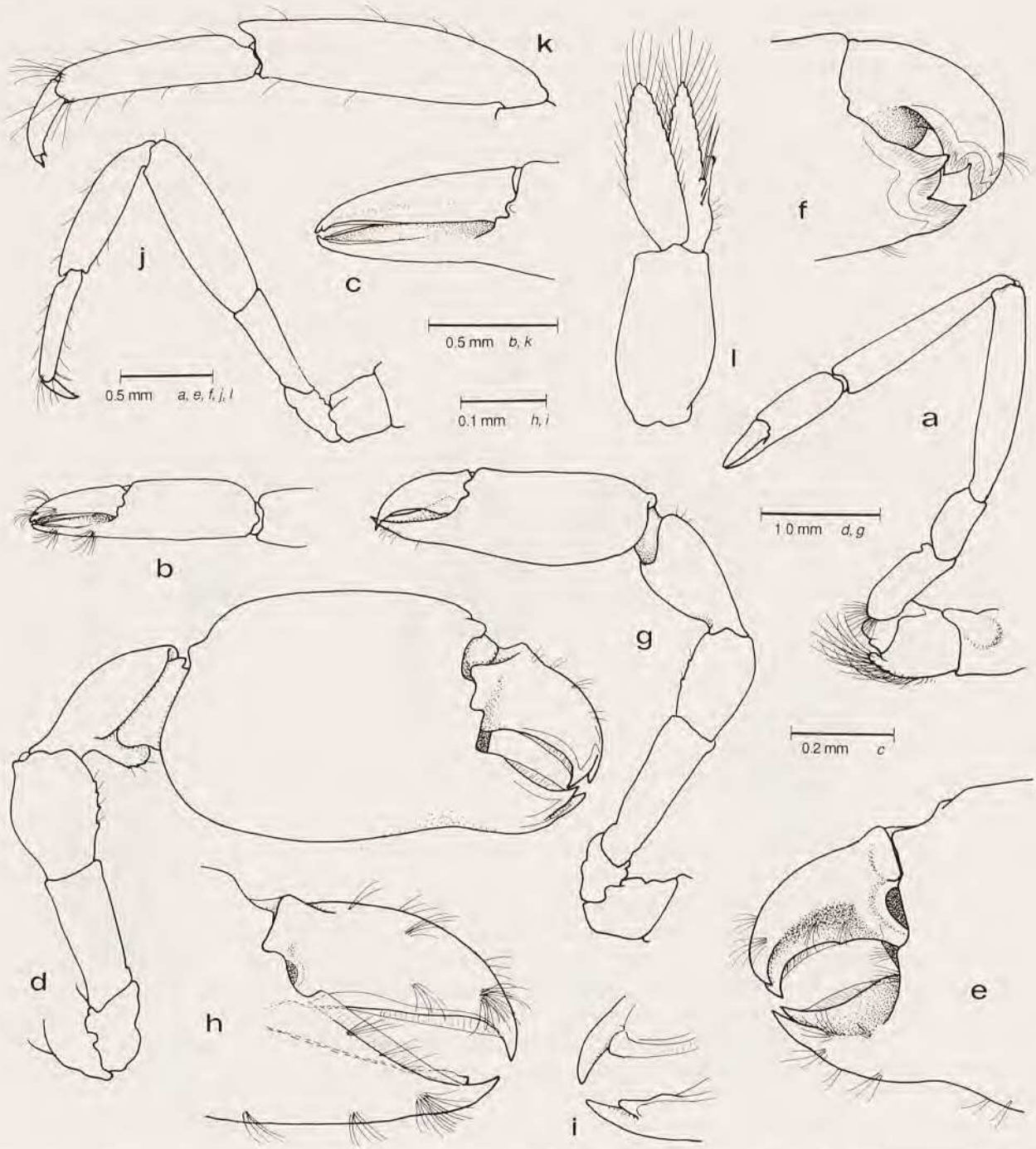

FIG. 27. — *Typtonychus crassimanus* gen. nov., sp. nov., ♂, holotype (MNHN-Na 12845) : **a**, first pereiopod; **b**, same, chela; **c**, same, fingers; **d**, major second pereiopod; **e**, same, fingers, medial; **f**, same, lateral; **g**, minor second pereiopod; **h**, same, chela, fingers; **i**, same, tips of fingers, medial; **j**, third pereiopod; **k**, same, carpus, propod, dactyl; **l**, second pleopod.

MEASUREMENTS (mm). — Postorbital carapace length, 2.25; carapace and rostrum, 3.25; total body length (approx), 8.0; second pereiopod, major chela, 2.9, minor chela, 1.8.

HOST AND COLOURATION. — No data.

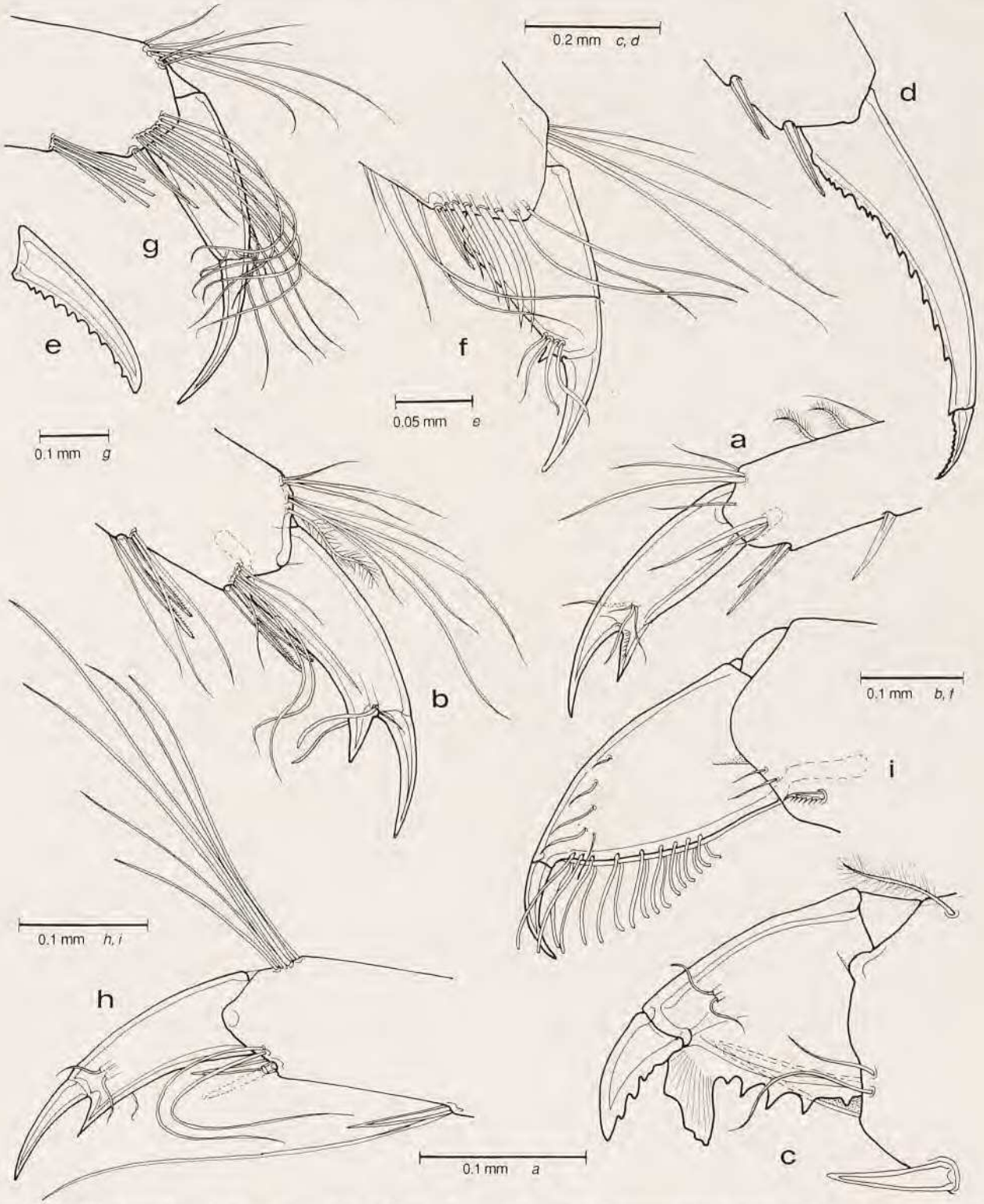

FIG. 28. — Third pereiopods, distal propod and dactyl : **a**, *Brachycarpus biunguiculatus* (Lucas). — **b**, *Mesopontonia* sp. — **c**, *Onycocaris aualitica* (Nobili). — **d**, *Periclimenaeus ? arabicus* (Calman); **e**, same, unguis. — **f**, *Periclimenes amboinensis* (de Man). — **g**, *Periclimenes uniunguiculatus* Bruce. — **h**, *Periclimenes involens* sp. nov. — **i**, *Pontonia simplicipes* sp. nov., holotype female.

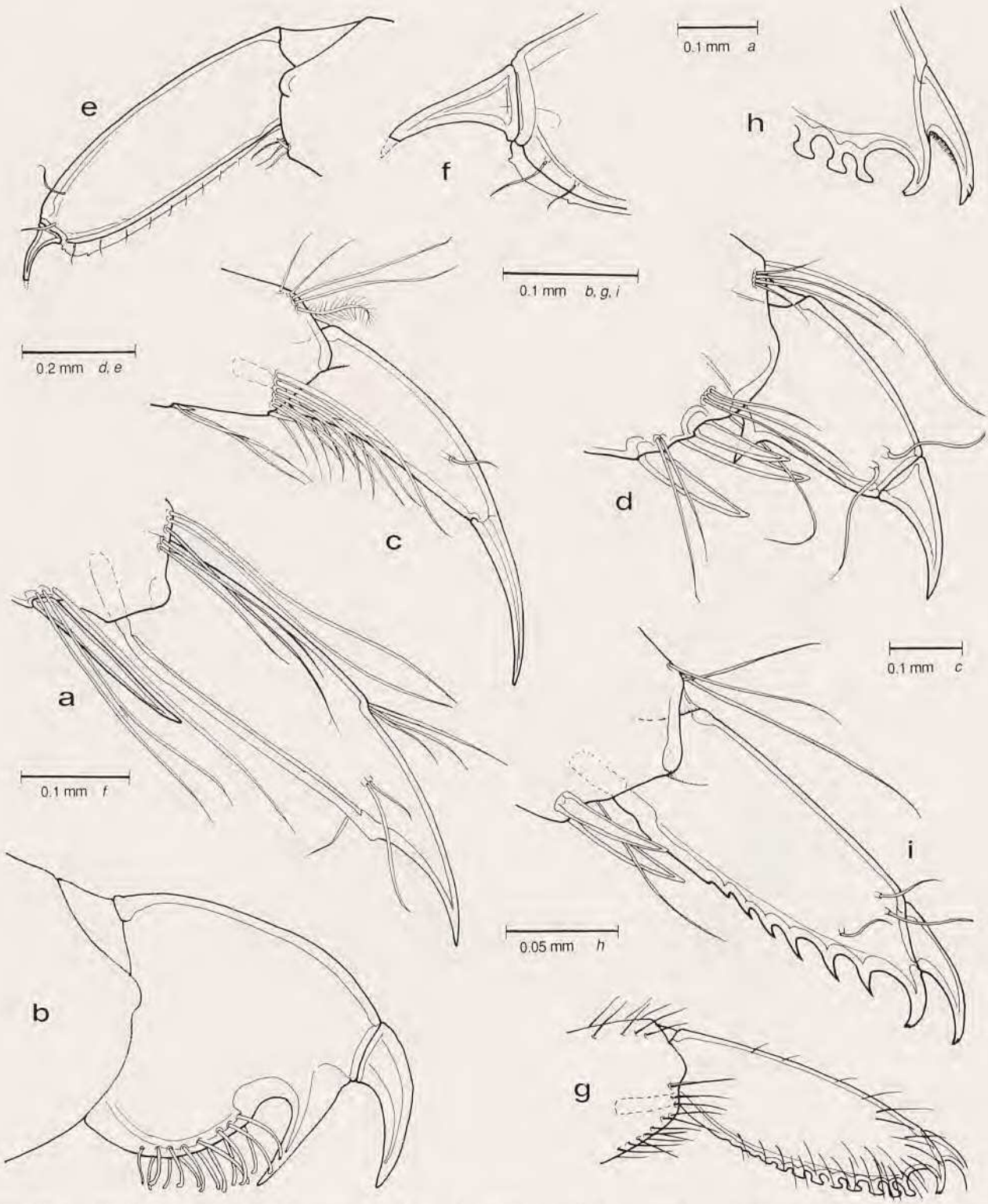

FIG. 29. — Third pereiopods, distal propod and dactyl : **a**, *Urocaridella antonbruunii* (Bruce). — **b**, *Conchodytes philippinensis* sp. nov., holotype female. — **c**, *Mesopontonia verrucimanus* sp. nov., ovigerous female holotype. — **d**, *Periclimenaeus storchi* Bruce. — **e**, *Periclimenes albatrossae* Chace & Bruce; **f**, same, unguis. — **g**, *Pontonia ascidicola* Borradaile; **h**, same, unguis. — **i**, *Pontonia anachoreta* Kemp.

ETYMOLOGY. — From *crassus* (latin) thick, stout, and *manus* (latin), hand.

SYSTEMATIC POSITION. — *Typtonychus crassimanus* may be readily distinguished from the three other species now placed in this genus, *T. anomalus* (Bruce), *T. dimorphus* (Bruce), and *T. dentatus* (Fujino & Miyake) by (i) the relatively enormous chela of the major second pereiopod with its shovel-like fingers, both provided with very large broad bidentate tips, and (ii) the acutely produced pleura of the fourth and fifth abdominal segments. *Typtonychus crassimanus* is relatively isolated by these features from the other species of the genus.

The four species of *Typtonychus* may be distinguished by the following key :

1. Rostrum dorsally multidentate **2**
— Rostrum with single dorsal tooth only ..... *T. dimorphus* (Bruce)
2. Chela of major second pereiopod with fixed fingers deeply dentate distally **3**
— Fixed finger of major second pereiopod distally simple ... *T. dentatus* (Fujino & Miyake)
3. Fourth and fifth pleura broadly rounded posteriorly ..... *T. anomalus* (Bruce)
— Fourth and fifth pleura posteroventrally acute ..... *T. crassimanus* sp. nov.

Family ANCHISTIOIDIDAE Borradaile, 1915

Genus *ANCHISTIOIDES* Paulson, 1875

Anchistioides willeyi (Borradaile, 1899)

Palaemonopsis willeyi Borradaile, 1899 : 410, pls 36, 37 fig. 7.
Amphipalaemon willeyi - BORRADAILE, 1917 : 407, pl. 59 fig. 13.
Anchistioides willeyi - GORDON, 1935 : 435, figs 23a, 24a. — BRUCE, 1991a : 269-272, figs 3g, 29, 30.

MATERIAL EXAMINED. — **New Caledonia**. Reef north of N'Do Islet, 37 m, SCUBA diving, 1 July 1986, coll. P. TIRARD, in sponge [R. 1060] : 1 ♂ (MNHN-Na 12919).

LAGON : stn DW 1068, 19°57.3'S, 163°52.8'E, 26 m, 23 October 1989, coll. B. RICHER DE FORGES : 1 ♀ (MNHN-Na 12918). — Stn 1069, 19°59.1'S, 163°52.5'E, 30 m, 23 October 1989, coll. B. RICHER DE FORGES : 1 ♀ (MNHN-Na 12917).

REMARKS. — The species has been previously recorded from New Caledonian waters (BRUCE, 1991a) and the specimens add nothing to the previously available information. All have the chelae of the second pereiopods of the long-fingered form. The male has a carapace length of 10.2 mm and a rostral dentition of 8/3, the females 9.5 and 5.8 mm and the smaller female a dentition of 8/4. In the larger female the rostrum and anterior carapace are missing. All specimens have the distomedial lamella of the scaphocerite distinctly angulate.

DISTRIBUTION. — Type locality : Ralun, New Britain. Also known from East Africa; Madagascar; Maldive Islands; Indonesia; Great Barrier Reef, Australia; Philippines, to 127 m.

Family HYMENOCERIDAE Ortmann, 1890

Genus *HYMENOCERA* Latreille 1819

Hymenocera picta Dana, 1852

Hymenocera picta Dana, 1852 : 593; 1855, pl. 39 fig. 3. — CATALA, 1964 : 89, pl. 22 fig. 1.
Hymenocera elegans Heller, 1861 : 25.

MATERIAL EXAMINED. — **New Caledonia**. Maitre Islet, SCUBA diving : 1 ovig. ♀ (MNHN-Na 12890).

REMARKS. — The single example has a carapace length of 7.6 mm, with a rostral dentition of 8/1 with the first two teeth situated on the carapace. No trace of colour pattern is preserved. The species has been previously recorded in New Caledonian only by Dr R. CATALA (1964).

The second maxilliped lacks a podobranch on the epipod and the third maxilliped somite bears a small arthrobranch attached dorsolaterally to the articular membrane dorsal to the lateral plate of the coxa. The thoracic sternites are mainly unarmed, the third with oblique, posteriorly convergent lateral ridges anteriorly, with a small median boss posteriorly; the fourth and fifth with low transverse lateral ridges posteriorly. The dactyls of the ambulatory pereiopods are distinctly biunguiculate.

DEBELIUS (1984) drew attention to the differences in colour pattern between Indian Ocean and Pacific Ocean specimens of this taxon. CHACE and BRUCE (1993) treated these as representing colour phases of a single species but, in view of their apparently allopatric distributions, it may be preferable to consider them a subspecies. As they are particularly popular with marine aquarists, perhaps it should not be too difficult to establish if specimens of Indian and Pacific Ocean origins are reproductively isolated.

DISTRIBUTION. — Type locality : Raraka, Tuamotu Archipelago. Uncommon, but widespread throughout Indian and Pacific Oceans, from the Red Sea, to Hawaii and the Tuamoto Islands, as well as in the Eastern Pacific region, but not recorded from the Atlantic Ocean.

ACKNOWLEDGEMENTS

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FIG. 30. — *Brachycarpus biunguiculatus* (Lucas, 1846), New Caledonia, Lareignière Reef, 3-12 m.

FIG. 31. — *Urocaridella antonbruunii* (Bruce, 1967), Loyalty Islands, Ouvéa, Mouli, 11 m.

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